

NAVY ELECTRONICS DIRECTORY

Frederick W. Chesson
Waterbury, Connecticut

NAVAL COMMUNICATIONS-ELECTRONICS EQUIPMENT

The following listing covers U. S. Navy electronic equipment from before World War I up to the introduction of the AN designation system.

The Navy did not follow the BC- and SCR- equipment nomenclature of the Army Signal Corps [1], but initiated its own system ca. 1915. Two-letter codes commencing with "C" were employed at first to identify commercial suppliers. CA, for example, designated equipment made by the American Radio Research Corp., while CF stood for de Forest Radio Telephone & Telegraph Co. These two-letter designations are mainly of the WW I period, but a few, representing such durable firms as CG (General Electric) and CW (Western Electric), saw use well past World War II. By mid-1943, the flood of new contractors was such that it became necessary to issue four-letter combinations [2].

There was a second, shorter-lived system. Since the Navy's Bureau of Steam Engineering had design responsibility for radio equipment, many sets of 1917-25 vintage were designated with SE-numbers.

Later ('20-'40s) and larger systems like radar sets employed alphabetic combinations, such as A(**) for aircraft equipment (e. g., the ABA IFF set, which also had the Signal Corps designation SCR-515), while B(*) was used for ship-board IFF equipment, D(**) covered direction-finding equipment, G(*) identified general aircraft transmitters, etc. Suffix numbers (or, occasionally letters) designated modified versions of the systems.

For components of these systems, five-digit numbers were assigned beginning with digit pairs representing particular "supply classes": 20xxx for power apparatus, 38xxx for vacuum tubes, 46xxx for receivers, 52xxx for transmitters, etc. In the case of radar and sonar equipment, the last three characters were usually letters. Prefixed with the manufacturer code, the resulting identifier might be "CNA-46080," the receiver portion (made by National) of the RAS-3 receiver system.

As common electronic equipment began to be used by both services, especially in aircraft, Joint Army-Navy, or AN/***, designations began to appear in 1943 and were in use for new equipment by the end of the war.

For reference, contract numbers (9xxxxx) are included in the listing where available.

SOME VERY EARLY EQUIPMENT IDENTIFIED MAINLY BY MAKER

A	Early receiver, 60-600 kHz, 1912
B	Early receiver, 30-300 kHz, 1912
C	Early receiver, 1.2-3.0 MHz, ca. 1913
K	Arc transmitter, 2 kW
Q	Arc transmitter, 2 kW
X	Arc transmitter, 2 kW

CE-606A	Spark transmitter, 0.5-1.0 MHz, 0.5 kW, E. J. Simon Co., 1917
CE-827	Spark transmitter, 0.315-1.0 MHz, 0.5 kW, ca. 1918
CE-859	Spark transmitter, 0.315-1.0 MHz, 0.5 kW, 1917
CE-861	Spark transmitter, 1 kW, ca. 1918
CE-1221	Spark transmitter, 1 kW, 1918
CL-304	Spark transmitter, 95-400 kHz, 10 kW, Fritz Lowenstein, 1917
CL-342	Spark transmitter, 0.150-1.0 MHz, 2 kW, 1917
CL-343	Spark transmitter, 95-400 kHz, 10 kW, 1917
CL-344	Spark transmitter, 0.150-1.0 MHz, 2 kW, 1917
CL-345	Spark transmitter, 0.150-1.0 MHz, 2 kW, 1917
CM-296	Spark transmitter, 1.7-2.4 MHz, 0.5 kW, American Marconi, 1917
CM-305	Spark transmitter, 0.15-1.0 MHz, 2 kW, 1917
CM-306	Spark transmitter, 2 kW, 1917
CM-307	Spark transmitter, 0.15-1.0 MHz, 2 kW, 1917
CM-858	Spark transmitter, 0.095-1.0 MHz, 5 kW, ca. 1918
CM-1080	Spark transmitter, 0.5-1.0 MHz, 2 kW, 1918
CN-208	Receiver, National Electrical Supply Co., 0.1-1.2 MHz
CR-654A	Spark transmitter, 0.315-1.0 MHz, 0.5 kW, Wireless Specialty, ca. 1918
CR-655	Spark transmitter, 0.15-1.0 MHz, 2 kW, ca. 1918
CR-1125	Spark transmitter, 0.095-1.0 MHz, 5 kW, 1918
CT-1038	Arc transmitter, 20 kW, Federal Telegraph Co.
CT-1042	Arc transmitter, 30 kW
CT-1201	Arc transmitter, 20 kW

LATER EQUIPMENT

AB(*) - AIRCRAFT EQUIPMENT, IDENTIFICATION-FRIEND-OR-FOE (IFF)

ABA	Mark IV IFF transponder, 470 & 493.5 MHz, Navy equivalent of SCR-515 (BC-645), 14/28 V, 1941. Uses dynamotor CWD-21AAX, equivalent to Army PE-103. Has same automatic self-destruction features as SCR-515. Able to be used in conjunction with ABK, to be identified by ground radars having either Mk III or MK IV IFF interrogators. Manufactured but not actually used - Mk III was chosen as standard system by U. S.-British agreement.
ABD	IFF equipment, Philco/Raytheon, 38-52 and 195-220 MHz, CPR-46AAH, 1942
ABE	IFF equipment, Philco/Raytheon, 100-116 and 175-225 MHz, CRP-43AAP, 1942
ABF	IFF set
ABK	Mk III IFF transponder, 157-187 MHz, like SCR-595C, made by Philco, Hazeltine, and Zenith, CZR-43AAY (24 V) and CHZ-43AAX (12 V), 900909, 1943. Uses British-style power and antenna connectors. Models through ABK-7.

AI(*) - AIRCRAFT INTERCEPT RADAR EQUIPMENT

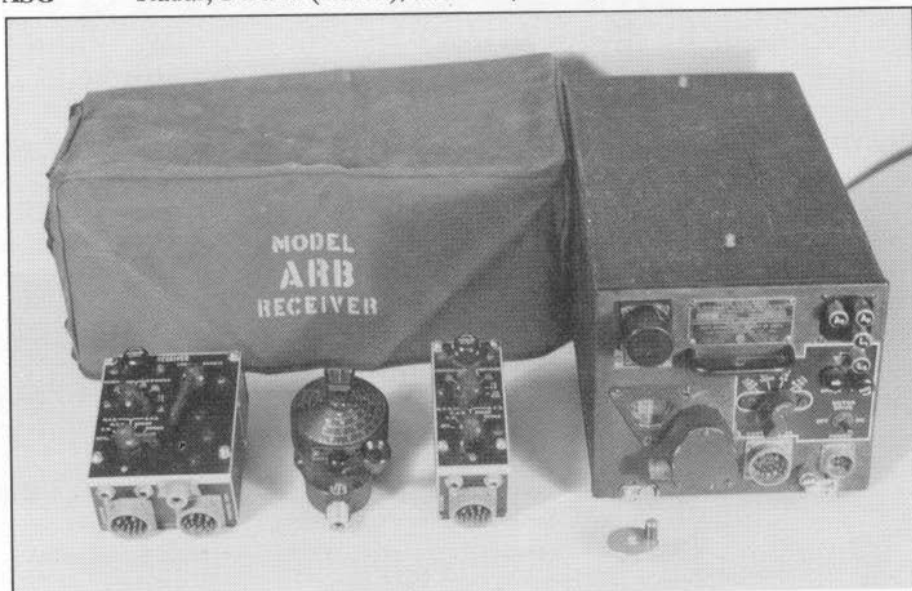
AIA	First night-fighter radar, S-band, became AN/APS-6 ca. 1944
------------	---

AR(*) - AIRCRAFT RECEIVING EQUIPMENT

- ARA** Receiver, 0.19-9.1 and 9.1-13.5 MHz (CBY-46102 through -46107), like SCR-274N LF-MF-HF sets, 28 V, Aircraft Radio Corp. and Stromberg-Carlson.
- ARB** Receiver, 195-9150 kHz in 4 bands, AM-CW-MCW, 28 V, motor-operated bandswitch, RCA, 1941. Designed for application with the ATB transmitter but used mainly with others. IFs 135 kHz (bottom two bands; 915 kHz (top bands). 28 V, internal dynamotor. RCA commercial designation, AVR-50. Production 30,000. Main units are CRV-46151 receiver, CRV-23254 pilot's control box, CRV-23256 radio operator's control box, and CRV-23253 tuning head.
- ARE** Radio, 1942
- ARJ** Aircraft TV receiver, 264-312 MHz, 28 V.
- ARK** Aircraft TV receiver, 324-372 MHz, 28 V, ca. 1944

AS(*) - AIRCRAFT SEARCH RADAR

- ASA** Radar, 400-MHz predecessor of ASB-series (not built), RCA, 28 V, 1941
- ASB** First Navy airborne radar, 509-556 MHz, 1941 (receiver CPR-46ACJ or CAY-46AAM; indicator CQC-55ACB, transmitter CAY-52ABV or 52ACV), models to ASB-7 by 1944. Earliest receivers used acorn tubes in front end; later used lighthouse tubes. Began as XAT.
- ASC** Radar, S-band, WE, adapted from Army SCR-520, 1942-44.
- ASD** Radar (Sperry), later AN/APS-3, (Philco), 1943
- ASE** Early radar, based on British ASV, 176 MHz, Philco/WE, 1942
- ASG** Radar, S-Band (Philco), later AN/APS-2, 1942



ARB receiver (CRV-46151) and accessories

Photos: Flemington Signal Depot

ASH Radar, X-Band, later AN/APS-4, WE, 1943

AT(*) - AIRCRAFT TRANSMITTING EQUIPMENT

- ATA** Transmitters, like SCR-274N HF transmitters but broader frequency range, 0.5 to 9.1 MHz in eight units (0.5-0.8, 0.8-1.3, 1.3-2.1, 2.1-3, 3-4, 4-5.3, 5.3-7, 7-9.1, designated CBY-52302 to -52305, -52232, and -52208 to -52211 respectively). 25 W CW, 12 W MCW, 8 W AM, 28 V. Aircraft Radio Corp. and Stromberg-Carlson.
- ATB** Transmitter, 2.3-9.05 MHz, 2 preset chans., 35 W AM-MCW, 55 W CW, 28 V, R/B ATC, U/W ARB, RCA identifier ATD-50, 1941, production 4000. Main units CRV-52233 transmitter, two CRV-47192 tuning units, CRV-21724 dynamotor, CRV-23314 pilot's control box, CRV-23313 operator's control box. About 3000 made.
- ATC** Transmitter, later redesignated T-47/ART-13, 0.2-1.5 and 2-18 MHz, 10 preset chans., 50 W AM or 100 W CW, Collins autotune, frequency-meter style VFO, 813 final and 811 modulators, COL-52286. Other units: COL-21932 28-V dynamotor, COL-21931 115-VDC dynamotor (!), COL-47281 antenna load coil, COL-48628 antenna shunt capacitor. Also see TCZ.
- ATD** Transmitter, 0.2-15.8 MHz, 50 W CW, 40 W AM, Bendix, 1940, 28 V, 814 final stage. Main components are CRR-52253 transmitter, CRR-55079 remote indicator, CRR-23280 remote control unit, CRR-21748 dynamotor, and CRR-47206 through 47211 tuning units.
- ATE-ATH** RCA, 28 V. Other details unavailable.
- ATJ** Aircraft TV transmitter, sends to ARJ, freqs. 276 and 312 MHz.
- ATK** Aircraft TV transmitter, sends to ARK, freqs. 264, 276, 288, 300, and 312 MHz, became T-61/AXT-2.

AY - AIRCRAFT RADAR ALTIMETERS

- AYB** Altimeter, 420 MHz FM, 1 W, CRV-43016 (14 V) or CRV-43017 (28 V)

B(*) - GENERAL SHIP & SHORE IFF EQUIPMENT

BA, BE, BF, BG, BH, BI,

BJ, BK, BL, BM, BO

Shipboard IFF interrogators, 1942-44

- BN** Shipboard IFF interrogator, 157-187 MHz, 117 VAC 60 Hz or, in some models, 400 Hz. Main components include:

10233 equipment cabinet	50ACW duplexer
10367 cabinet (modified)	52ACQ transmitter oscillator
43ACB mod. & IF-video conv.	66ACG antenna
46ACW IF converter	66AFJ antenna (alternate)

- BO** Shipboard IFF interrogator, 1942-44

- BP** Improved BN (different RF circuits: lighthouse tubes replacing 6J6s in the receiver; push-pull 15Es in the transmitter in place of a single 15E)

CB(*), CC(*) - TEST EQUIPMENT

CBL-1 Oscilloscope
CBQ VTVM, 900894; CBQ-3, 900945
CCP Sonar test equipment, 900878

CX() - EXPERIMENTAL COMMERCIAL EQUIPMENT**

(also see X[**])

CXC DF receiver, 2-25 MHz in 5 bands, CW-MCW-AM, CRV-46AAB with CRV-69AAA loop
CXAJ Receiver, 125-140 MHz, CW-MCW-AM, 12 V, GE
CXAM Later version of XAM radar, ca. 1939
CXAS See FA radar.
CXAX See WCA.
CXAY Sonar, CBM-78131, 40 kHz
CXAZ Fire-control radar, became Mk 5, 1942
CXCH See SO radar.
CXDT See SP radar.
CXFG Radar deception device, "Moonshine," 1943, became MBE.
CXGE Radar jammer, ca. 1943
CXGL Radar DF set, 91114
CXGS Radar DF set, 91022
CXGU S-Band echo-box test set, WE, 1943
CXJW Shore station transmitter, 91167
CXKH Radar DF set, 91021

D() - DF AND LORAN NAVIGATION EQUIPMENT, RADIO & RADAR**

DA Direction finder, modified SE-1440, 250-600 kHz, 1918
DB DF receiver, 45-600 kHz, 1922
DK DF receiver, 0.1-1.5 MHz, 1930
DL, DM DF receivers, 0.1-1.5 MHz, 1931
DN DF receiver, 0.1-1.5 MHz, 1942
DO DF set for submarines using CRV-69003 loop
DP DF receiver, 0.1-1.5 MHz, CRV-46136, 117 V, models through DP-14, 1934
DQ DF loop for RAK receiver, 1935
DT DF receiver, 2.5-30 MHz, 1936, originally XAB
DU DF loop, used with ARB and similar receivers, 0.2-1.5 MHz, 1938
DV, DW DF receivers, 0.2-1.5 MHz, 1938. DW-1, Bendix, 1940
DX Assembled DF equipment
DY Later model of DT, 1939
DZ Aircraft DF receiver, superhet, 0.015-1.5 MHz in 6 bands, 28 V with external dynamotor, uses loop with sense antenna, CRV-46152 (DZ-2), 1939, 3000 units made.
DAE DF receiver, superhet, 0.1-1.5 [or 0.24-2.0 in 3 bands] MHz, 175 kHz IF, 117 V, Radiomarine Co., CRM-46238, 900834, 1942, uses 14" loop with sense antenna.
DAF DF receiver, 0.1-1.5 MHz, Radiomarine, 1942

DAG DF receiver, 1.6-18.2 MHz in 3 bands, CIA-46174
DAH DF receiver, 0.1-1.5 MHz, Radiomarine, 117 V, 1942
DAJ DF receiver, 1.5-30 MHz (shore station), Federal CFT-46184, includes CFT-52365 test transmitter, 1942
DAK DF receiver, 0.1-1.5 MHz, 1942
DAL, DAM Related to DAJ-DAO (details unavailable)
DAN DF set, same receiver as DAJ, uses 4 goniometers and 4 sense coils depending on frequency
DAO DF receiver, related to DAJ (details unavailable)
DAP DF receiver, 0.1-1.5 MHz, 1942
DAQ DF receiver, 1.5-22 MHz (shipboard), crossed-loops type, 1942
DAR DF receiver, 1-20 MHz, 1942
DAS-1 LORAN receiver-indicator, 1.7-2.075 and 9.9-12.1 MHz (basis of SCR-722, related to AN/APN-4), 900752, 1943; models through DAS-4, Fada Radio, 1945
DAU DF receiver, 1.5-22 MHz (like DAQ) with panoramic adapter, crossed-loops type, 1943
DAV DF paratrooper receiver, 2.3-4.5 MHz, Communications Co. Inc., 1943
DAW DF receiver, up to 30 MHz (mobile version), 1943
DBA DF receiver, 1.5-30 MHz, 1944
DBB DF set, 90-300 and 300-1000 MHz (may be based on RDO or AN/APR-1 components).
DBE LORAN set, 900659, 1944
DBF DF receiver, 100-156 MHz, 117 VAC, includes target transmitter covering 17.8-158 MHz in 3 bands, CW-MCW, battery-operated (probably MRD-8).
DBN DF receiver, ca. 1945
DBS LORAN receiver, 900306, 1944
DBU Submarine radar intercept receiver, 0.1-1.0 GHz, 1944. Began as XCV.
DBV Submarine radar intercept receiver, 2.0-3.5 GHz, 1944. Began as XCY.

F(*) - GENERAL RADAR FIRE CONTROL EQUIPMENT (EARLY)

FA First fire-control radar (Mark 1), 700 MHz, 25-40 kW, 1940. Began as CXAS.
FC Mark 3 fire-control radar (improved FA), 40 kW, 1941
FD Mark 4 fire-control radar, 700 MHz, 40 kW, 1941
FG Radar, WE, early
FH Mark 8 fire-control radar, 3.0 GHz, 100 kW, 1942
FJ Mark 9 conical-scan X-band radar, 30 kW, 1942
FL Mark 10 conical-scan X-Band radar, 30 kW, 1942
FM Mark 12, fire-control radar, 1943

G(*) - GENERAL AIRCRAFT EQUIPMENT

GF Transmitter, 2.0-2.5, 3.0-4.525 and 6-9.05 MHz via five plug-in coilsets, 15 W AM-MCW-CW, 14 or 28 V, screen-modulated, used



GF-12 (CW-52063A) transmitter

with RU receiver, 1932-42. GF-11 model is WE CW-52063A, using CW-23097 control box. Typical radio combinations were GF-1/RU-3, GF-2/RU-3A, GF-3/RU-4A, GF-4/RU-5A, GF-8/RU-13, GF-11/RU-16, GF-11/RU-18, GF-12/-RU-17, and GF-12/-RU-19. Designer, and original maker, was Aircraft Radio Corporation; later WE. Original design was close to that of the Army BC-230 (SCR-183), but was

given newer tubes in the late '30s: 837s in place of 801As, 89s in place of 45 Specials.

- GH Transmitter, 4-13.575 MHz, 100 W, Westinghouse, ca. 1931
- GI Transmitter, 4-13.575 MHz, 100 W, General Electric, ca. 1931
- GK-1 Receivers, CAY-46007, 0.015-1.0 MHz in 6 bands, and CAY-46009, 0.1-1.0 MHz in 3 bands.
- GL Aircraft radio, 52-60 MHz, 1 W, AM, 1930
- GN Transmitter, WE, 100 W, intended for use with RAM receiver.
- GO-9 Transmitter, 0.3-0.6 and 3.0-18.1 MHz, 70 W AM or 100 W CW, separate LF and HF transmitters using 803 final amps. powered by 117 V 800 Hz and 14/28 V, often used with RAX receiver. TBW is similar. WE design originally, later GE and Westinghouse.
- GP Transmitters (through GP-7), 0.35-1.5 and 3-9.05 MHz, similar to TCE and shares tuners with it. WE design originally, later RCA and Westinghouse.

J(*) - GENERAL SONAR RECEIVING EQUIPMENT

- JK Sonobuoy hydrophone, supersonic, 13-37 kHz, related to WDA-1, ca. 1930.
- JM First radio sonobuoy, for harbor defense, CIA-10090, 1941. Apparently transmits to RBF receiver.
- JP Sonobuoy, hydrophone, ca. 5 kHz
- JR Harbor-defense sonar, with 7 Rochelle-salts sensors
- JT Sonar, RCA
- JAA Receiver, 0.1-4 kHz

L(*) - GENERAL CALIBRATION EQUIPMENT

LD	Frequency meter, 0.1-5.0 MHz, GE, models through LD-3
LF	Frequency meter, 30 kHz-30 MHz, for major bases, ca. 1928, includes xtal oven
LG	Frequency meter, shipboard model of LF, ca. 1930
LJ	Frequency meter, 0.195-1.5 and 3.0-13.575 MHz, 10 crystal channels.
LM	Frequency meter mainly for aircraft, 0.125-20.0 MHz (0.195-20 before LM-10), with 125-kHz calibration crystal, 1934, models through LM-19. Power required: LM: 14 V and 200-260 V LM-1, -3: External batteries LM-2, -4, -5: 14 V and 200-260 or 260-475 V LM-4A: 28 V and 200-260 or 260-475 V LM-7, -9, -10, -12, -14, -16, -19, -20: 14 or 28 V plus 200-260 or 260-475 V LM-13, -17: 12 V and 180 V (internal batteries) LM-6, -8, -11, -15, -18: 117 VAC (using rectifier 20120 or 20104A). Units were CKB-74028 (LM-14, -15, -16, -17); CRR-74028 (LM-18 or -19). The feature of accepting 260-475 V plate feed was added for powering from the 475-V dynamotor of later GF-RU combinations. LM is similar in many ways to the Army BC-211, but has many design changes such as use of a voltage regulator and different mechanical layout. Makers: Bendix, Mission Bell.
LO	Audio oscillator, beat-frequency type, replaced by LAJ
LP	Signal generator, 9.5 kHz - 30 MHz AM-CW, Federal Mfg. and Eng. Co., models through LP-5
LR	Frequency meter, heterodyne, 160 kHz - 15 MHz, 100-kHz calibrator with frequency dividers, 91136, models through LR-3
LT	Test set for ABA IFF set
LW	L-Band radar test set, 680-720 MHz, WE, includes signal generator and scope, CW-60AAL, 1943
LX	Signal generator, 7.5-330 MHz AM-CW, Washington Institute of Technology, Inc. (appears to be a standard Ferris generator with external modulator-attenuator)
LZ	Power meter, WE, 2.7-3.4 GHz, with antenna and detector.
LAD	Signal generator
LAE	Signal generator, 0.52-1.3 GHz, AM-CW-pulse, uses 2C40 tube, models through LAE-4, Airadio, Inc.
LAF	Signal generator, 90-600 MHz, pulse, uses 2C40 tube, Frank Reiber, Inc.
LAG	Signal generator, 1.2-4.0 GHz CW-FM-pulse, General Communications Co.
LAJ	Audio oscillator, 20 Hz - 20 kHz, Triumph Mfg. Co., models through LAJ-2, appears to be repackaged HP 200A, replaces LO, 91143
LAM	Frequency monitor, 1:10,000,000, RCA, later AN/FRM-3, 1946

M() - GENERAL RADIO RECEIVING EQUIPMENT**

MD	Radio, 3-4 MHz, General Electric, 1927
ME	Radio, 3-4 MHz, Westinghouse), 1927
MK	Paratroop transceiver, repl. by MV through MX and then by MAB
MM	Advance-base station, RBM receivers and TBW transmitters
MO	Related to MAK; powered by 6-V vibrator supply, Communications Co. Inc.
MQ	Transmitter-receiver, Radiomarine ET-8028, 2.0-3.5 MHz, 4 chans, 5 W, 6-V and 12-V models
MU	Paratroop transceiver, 2300-2800 kHz (normally 2436 or 2772), xtal, 0.2 W AM (see MAB)
MV	Paratroop transceiver 2800-3300 kHz (normally 3035 or 3135), xtal, 0.2 W AM (see MAB)
MW	Paratroop transceiver 3300-3900 kHz (normally 3585, 3725, or 3865), xtal, 0.2 W AM (see MAB)
MX	Paratroop transceiver 3900-4600 kHz (normally 3995, 4105, or 4435), xtal, 0.2 W AM (see MAB)
MAB	Paratroop transceiver, 2300-4600 kHz, CCI-43085, replaced MU through MX. Includes CCI-43045 transceiver, dry batteries or CIA-20221 vibrator PS, CCI-66081 hand-held whip antenna unit. Circuit only loosely related to Army transceivers like BC-611 or BC-745.
MAH	Receiver-transmitter, 140-144 MHz, 10 W AM, 4 channel, U/W TCS HF set. Uses DY-10/ARC-4 dynamotor; 12 or 24 VDC; rectifier available for AC operation.
MAK	Transmitter-receiver, 3.0-8.0 MHz, MCW-AM, 25 W, 6/12 V, vibrator power supply, Communications Co. Inc.
MAL	Mobile radio set, MAH and TCS, WECO
MAM	Transmitter-receiver, 1.2-12 MHz in 3 bands, xtal or MO, 40 W CW-AM, COL-52357, powered by rotary converter, Air-Track/Collins.
MAQ	Radio set, SCR-499-A, 2-18 MHz and SCR-542-A, 100-156 MHz
MAR	Receiver-transmitter, 225-390 MHz, 43067, related to RDR
MAS	Jammer set, like AN/ARQ-11
MAW	Receiver-transmitter, 115-156 MHz AM, 0.75 W, 10 chans. Includes 43069 R-T. Transmitter part of 43069 is coded 52367.
MAY	Receiver-transmitter, 225-390 MHz, 1 watt AM-MCW, backpack, CRP-43071, 6 V
MBE	Radar deception device (gives impression of huge fleet), successor to CXFG "Moonshine," 1943
MBF	Receiver-transmitter, 60-80 MHz AM, COL-43065
MBL	VHF transceiver, 60-80 MHz, Collins
MBN	Radio set
MBO	Portable radio, 1.5-12 MHz, 10-25 W, AM-CW, 10 channels
MBT	Radio set, 91115
MBZ-2	Signal buzzer
MHS-9	Head and chest set
MRD-8	Alignment transmitter, 17-160 MHz, 52358, P/O DAZ DF equipment, probably same as Army BC-655.

N() - GENERAL SONAR TRANSMITTING EQUIPMENT**

NA	Sonar beacon
NG	Sonar sender (Rochelle-salt transducer)
NJ	Lightweight echo sound recording equipment, 22.1-24.1 kHz (20.6 or 23.8 kHz, 60 W; or 21 kHz, 125 W).
NK	Portable echo sounding equipment, 6/12 V, models through NK-6
NM	Magnetostriction echo sounding equipment, 17-19 kHz, models through NM-16A. NMA supplies 400 W.
NGA	Sonar system, 2 channels (20 and 67 kHz), 900662. NGA-1 system, 91048.
NGB	Sonar system, 91017
NMC	Echo sounding equipment, 17-27 kHz, 12 W, RCA, 900443

P(*) - GENERAL AUTOMATIC CODING RECEIVERS & TRANSMITTERS

PD, PF, PG,
PH, PJ, PM

O() - GENERAL MEASURING, TEST AND TRAINING EQUIPMENT**

OB	Countermeasures modulation analyzer, 1944
OD-7	Tube analyzer, transconductance, seven meters, sim. to Weston 686
OE	VT voltmeters, multimeters, etc.
OF	Radar wavemeter & echo-box equipment
OG	Signal generator
OJ	AF impedance meter, 900994, models through OJ-3.
OK	Sonar computer
OM	Test monitor equipment
OP	Signal & sound-wave (audio) measuring equipment
OQ-3	Tube tester, transconductance, three meters, Weston 788, 1942
OR	Underwater sound analyzing equipment, WE, CW-60019
OS	Variously listed as oscilloscope, optical galvanometer recorder (GE), and fluxmeter
OT	Radar training equipment
OU	Training equipment
OV	Tube tester
OW	Sonar test equipment (OW-1 is listed as Air-Track Corp. code trainer)
OX	Radar trainer, Air-Track Corp.
OZ	Tube tester, transconductance, Hickok 550-X; also measures capacitance, resistance, and inductance. Models through OZ-2.
OAA-2	Frequency meter, radar, 150-240 MHz, AC-powered, 60ABC, measures freq. and relative power output.
OAE	Milliammeter
OAF	Frequency meter
OAH-4	Code-practice set, 91147
OAJ	Radar echo box ("resonance chamber), CYT-14AAL, Yale & Towne
OAK	Standing-wave measuring equipment, slotted line, 3.3 GHz, 62ABD, Philco/Raytheon

OAL	Test equipment
OAN	Signal generator
OAQ	Frequency meter, radar, 105-125 MHz, similar to OAA and OAF, 60ABA
OAP	Frequency meter, radar, 145-235 MHz (Hazeltine CHZ-60ABA or 60ACQ)
OAS	Sonar test set, including water target
OAU	Underwater practice target
OAV	Training equipment
OAW	Tube tester, portable, emission, General Communications Co.
OAX	Underwater sound generator (osc.-amp. and hydrophone), 17-26 kHz, 1 watt, Presto Recording Corp.
OBC	Variously listed as submarine hydrophone mount and as practice attack unit
OBE	RF oscillator, 40-200 kHz, 200 W, 117 V power, CG-35038
OBH	Analyzer
OBL	Oscilloscope, 3", 100 kHz, models through OBL-3, Reiner Electronics Co. and Triumph Mfg. Co.
OBO	Recording microvoltmeter equipment, AC-powered chart recorder
OBQ	VTVM, Hickok, 900318, models through OBQ-4
OBT	Oscilloscope, 3", DuMont and Reiner Electronics Co., 900296; OBT-1, 91126
OBU-4	Radar echo box, 2.9-3.1 GHz, CW-14ABA
OBZ	Tube tester, emission, CBM-60097
OCQ	Pulse generator, 3000-6000 pps, General Communications Co.
OCG	Oscilloscope, 5", same as TS-324/U and DuMont 241
OCJ	Radar target simulator
OCK	RF impedance bridge, 25 kHz - 5 MHz, measures R and C, Photo-switch, Inc.
OCL	Tube tester, 900807
OCP-1	Sonar port testing equipment, 900811
OCR-1	VOM, submersion-proof, Triumph Mfg. Co.
OCT	Frequency-shift monitor, 91131. Measures carrier freq. shift of FSK keys. OCT-2 includes CHZ-60170 superhet receiver, 1-26 MHz. Models through OCT-3.
OCV	Research receiver (Stoddard NM-3), 100-400 MHz, 1944
OCW	Insulation tester, 900726
OCY-1	Radar DF target transmitter equip., 91011
OCZ	Radar target simulator
OKA	Sound resolving equipment, 900791
OZI	Tube tester, 900346

Q() - SONAR LISTENING AND ECHO-RANGING EQUIPMENT**

QB	Sonar, ca. 1928
QC	Sonar, 24 kHz modulated with 1.1 kHz
QD	Depth measuring equipment
QF	Sonar training equipment

QG	Sonar, console version of QC
QJ	Sonar, console version of QB
QK	Sonar crystal scanning equipment
QL	FM sonar equipment
QX	Auxiliary sonar echo ranging equipment
QAA	Portable sonar, 500 kHz, 0.5 W
QBA	Sonar equipment
QBE	Sonar equipment, 17.5-25 kHz, 900419, related to WEA-5
QBF	Sonar, 22.5-25.5 kHz, 130 W, WE
QBG	Sonar equipment
QBH-4	Sonar scanning equipment, 10-50 kHz, 1953
QCD	Sonar, harbor defense, 15-27 (21, 23, 25, or 27) kHz, Raytheon
QCJ-2	Sonar system, 900720
QCL	Sonar system, RCA, 900720
QCN	Sonar, Submarine Signal Co, 24 kHz
QCQ-2	Echo range equipment, RCA, 900805
QCR	Sonar, Raytheon
QCS	Sonar, Raytheon
QCT	Sonar, Raytheon
QCU	Sonar system, 17-27 kHz, 10 W, RCA/Raytheon, 900740
QDA	Sonar target depth equipment, 900700
QFE	Sonar equipment
QFG	Countermeasures sound-effects generator, CRV-35028
QGA-1	Sonar equipment, 13-37 kHz, Raytheon, 91253
QGB	Sonar console, 17-26 kHz, 900805, RCA, ca. 1946
QHD	Sonar, Raytheon
QJA	Sonar, 22-28 kHz, 130 W, WE
QJB	Sonar, 22-28 kHz, 130 W, WE
QLA	Sonar, 36-48 kHz, 250 W, WE

R() - GENERAL RADIO RECEIVING EQUIPMENT**

RA	Receiver, 16-1200 kHz, TRF, submarine use, 1921
RB	Receiver, 10-50 kHz, TRF, shore-station use, 1920
RC	Receiver, 50-2200 kHz, TRF, shore-station use, 1920
RD	Receiver, 12-1200 kHz (for destroyers using two receivers), ca. 1921
RE	Receiver, 10-100 kHz, multiplexed on a common antenna, 1924
RF	Receiver, 75-1000 kHz, 1925
RG	Receiver, first HF, 1-20 MHz, 1926
RH	Receiver, 200-650 kHz
RI	Receiver, 40-1200 kHz
RK	Receiver, 12-375 kHz, TRF, 1926
RO	Receiver, TRF, 0.015-25 MHz, CAY-3362, for S-Class submarines, 1928. RO-2, CAY-3940, TRF, 0.015-1.0 MHz, 1929
RQ	Minesweeper receiver (CAY-3355), TRF, 0.015-1.0 & 1-22 MHz, 1929
RS	Receiver, 3.75-22 MHz, shore-station use, ca. 1930
RT	Receiver, 1-30 MHz, 1930

RU Receiver, TRF, 0.25-14.0 MHz in RU-1, later 0.195-13.575 MHz, via 13 plug-in coilsets, for fighter aircraft, 1931. Usually remote-controlled, often used with GF transmitter, models through RU-19, or originally Aircraft Radio Corp., then Stromberg-Carlson and WE. Odd-numbered later variants use 28 V; even-numbered, 14 V. Coilsets are plain or switchable between two bands (e. g., 0.4-0.5 and 6-9.05 MHz). Typical receiver is CW-46048D or -46051A. Uses CW-23012 remote tuning head, CW-21441 dynamotor, CW-62017 junction box, and CW-23096A or -23087 switch box. Had same design origin as Army BC-229 (SCR-183), but evolved with detail improvements and updates of tubes (e. g., 39s to 78s).

RAA VLF-MF receiver, superhet, 10-1000 kHz, AC operated, RCA, 1931

RAB HF receiver, superhet, 1-30 MHz, 1932

RAC Receiver, TRF, 12-80 kHz, shore-station use, RCA, 1931

RAE Receiver and tone keyer, 0.1-30 MHz, CRV-46018, 117 V

RAF Receiver, CG-46017, 117 V

RAG Receiver, TRF with separate heterodyne

osc., 15-600

kHz, band-

switched, CHS-

46042, 1933.

Uses CHS-

20032 117-V

power unit (or

batteries) and

CHS-23062

control unit.

RAH Receiver, TRF with separate heterodyne

osc., 0.6-23 MHz, CHS-46043, HF twin of RAG but with plug-in coils, ca. 1933. Uses same power and control units as RAG and CHS-47090 "inductance system" (storage box for the seven coil trays).

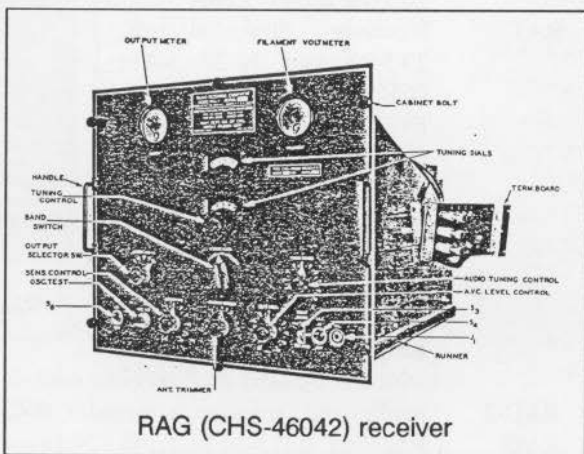
RAJ Receiver, 0.224-13.575 MHz, CW-MCW-AM, CRV-46046

RAK Receiver, regen. TRF, 16-600 kHz in 6 bands, CRV- or CND-46155, 1939, 117 VAC (CRV-20131 external power supply) or batteries, includes switchable audio filters. Uses CRV-23073 control unit; usable with CRV-66096 submarine loop antenna. Models through RAK-8. Made by RCA and Andrea.

RAL Receiver, regen. TRF, 0.3-23 MHz in 9 bands, HF analog of RAK, CRV-46156, RCA et al., 1939, models through RAL-8.

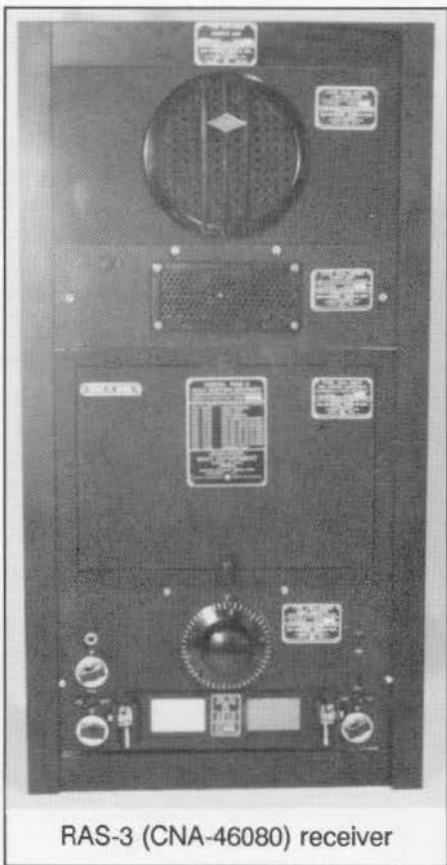
RAM Aircraft receiver designed to work with GN transmitter, WE.

RAO Monitoring receiver, 0.54-30 MHz, National 120 (NC-100XA with two RF stages and no S-meter), 455 kHz IF, 117 VAC or batteries, some sets made by Wells-Gardner, 1944



RAG (CHS-46042) receiver

- RAS** Receiver, 0.19-30 MHz, like National HRO Jr. but with 175-kHz IF, CNA-46080, 1939-43, models through RAS-5. Main components are CNA-46080 receiver, -20090 power unit, -49105 speaker unit, -10097 coil container, -47156 through -47162 coil-sets, and -10036 table rack. Could be fitted with CKB-50143 plug-in noise limiter. Despite manufacture by National, original 1939 contractor was General Electric Supply Corp.
- RAT** Receiver, dual, aircraft, 13.5-20 and 20-27 MHz (CBY-46083 and -45084), like a pair of ARAs in dual mounting, IFs 4.2 MHz on both, 14 VDC, 1939. RAT-1 uses 28 VDC with CBY-46108 and -46109 receivers. Both came equipped with CBY-23154 local-control adapter, but could be used with CBY-32155 dual-receiver control box for remote control.
- RAU-2** Radiosonde receiver & recorder, 900348, 1944
- RAW** Receiver, 0.175-30 MHz, like National HRO Jr. (big-pin tubes).
- RAX** Receiver, aircraft, General Electric and Air-Track. Three versions: 200-1500 kHz in 4 bands (CG-46115), 1.5-9 MHz in four bands (CG-46116), or 7-27 MHz in five bands (CG-46117), 28 V, IFs are 160, 915, or 2275 kHz; design sim. to SCR-274N with bandswitching. For local control only.
- RAY** Receiver, aircraft, 1943
- RAZ** Receiver, TRF, Radiomarine AR-8503, 15-600 kHz (originally 100-500), 117 V, 1939
- RBA** Receiver, shipboard, TRF, 15-600 kHz in 4 bands, improved RAA, 1941, used with CRB- or CRV-20130 rectifier; RBA-5, 91319; RBA-6, CFT-46300.
- RBB** Receiver, shipboard, superhet, 0.5-4.0 MHz in 4 bands, ca. 1940, used with CRV-20130 rectifier. RBB-2, 91319; RBB-3, 4, 91101. Made by RCA and Federal.
- RBC** Receiver, shipboard, superhet, 4.0-27 MHz, ca. 1940, like RBB except freq. range and 6AB7 first RF tube. Used with CRV-20130 rectifier. RBC-2A, 91290; RBC-3, 91319; RBC-3, 4, 91101. RBC-3A



had power unit for 400 Hz. Models through RBC-6.

RBD Receiver, CG-46132, 1.5-12 MHz, shares design aspects with RAX and BC-652.

RBE Receiver, diversity, 0.55-30 MHz, with loudspeaker, CG-46142, with single or dual preselector.

RBF-3 Receiver, 70-90 MHz FM, rack-mounted, 117 V, apparently for reception from JM sonobuoy.

RBG Receiver, 0.54-31 MHz, 455 kHz IF, Hammarlund HQ-120, CHC-46140.

RBH Receiver, National NC-156 (CNA-46188) (NC-100A with two RF stages), 0.3-1.2 and 1.7-16 MHz in 5 bands, 1560-kHz IF, 117 VAC or battery power. 1943

RBJ Receiver, like National HRO Jr., big-pin tubes, 0.05-30 MHz

RBK Monitoring receiver, 27.8-143 MHz, CW-AM-FM, 117 V, CFT-46130, 1944. Possibly adapted from Hallicrafters S-36.

RBL Receiver, shipboard or shore-station, regen. TRF, 15-600 kHz in 6 bands, National, octal tubes. Similar in appearance to RAO or RBH. RBL-2, CNA-46161, 1942; RBL-3, Wells-Gardner; RBL-5, CNA-46161B. Powered by 117 V, external batteries, or CNA-20214 6-V vibrator pack. Designed to meet the Navy radiation limit of 400 picowatts.

RBM Receiver pair; RBM-2, CCT- or CAY-46076, 0.2-2 MHz in 4 bands, 140 kHz IF; and

CCT- or CAY-46077, 2-20 MHz in 4 bands, 1255 kHz IF, ca. 1944.

For powering a pair of sets, uses CAY-21837 dual dynamotor unit (12 V), CAY-20086A rectifier (117 V 60 Hz), or CCT-20085 rectifier (117 V 25 Hz). Housed in water-tight box which becomes the operating table. Possibly also made by WE.



RBM-2 (CAY-46077) receiver

RBO Shipboard morale receiver (CZC-46139 or -46225), 0.53-1.6 and 5.55-15.6 MHz AM only, low-radiation type, like Scott SLR-12, ca. 1942. Used with CRV-49131 power amplifiers for ship-wide loudspeaker distribution.

RBP Receiver, 3.0-24 MHz in 3 bands, with tone keyer for high speed (50 dots per second), 117 V, RCA

RBQ Receiver, 132-156 MHz, one xtal channel, U/W TDG xmtr in shore stations for point-to-point links, CW-46168, outdoor-mounted, apparently an adaptation of a civilian radio-relay system.

RBS Receiver, shipboard, 2.0-20 MHz in 4 bands, 455 kHz IF, 14 tubes,

RBT	117 VAC, separate amp.-power supply, Stromberg-Carlson Receiver, 27-280 MHz in 6 bands, AM, National (possibly adaptation of 1-10)
RBU	Receiver
RBW	Monitoring receiver, 1944
RBX	Monitoring receiver, 1944
RBY	Receiver
RBZ	Receiver, 2-5.8 MHz, tunable personal set, receiver and battery box in canvas case on operator's chest, uses helmet as antenna (AC supply also made)
RCE	Receiver, 2-30 MHz, like National HRO Jr., big-pin tubes, ca. 1942
RCH	Receiver, shipboard or shore station, 80-560 kHz and 1.9-24 MHz, Scott SLR-F, CZC-46209, 117 VAC or 117 VDC via Scott Model 262 inverter. Also identified as AN/SRR-3.
RCK	Receiver, 115-156 MHz, four xtal channels, for aircraft carriers and shore stations, Scott
RCL	National, similar to NC-100.
RCO	Receiver, 100-156 MHz, 1 chan., 117 V, Communications Company, Inc.
RCP	Receiver, like National NC-100A
RCX	Panoramic adapter, 1944
RDC	Radar search receiver, 28.5-140 MHz in three bands, swept by motor, 5.25 MHz IF, 1944; RDC-A, 91289
RDE	Receiver, 2.0-8.0 MHz in 4 bands, with plug-in tuner, Communications Company, Inc.
RDF	Receiver, 0.2-0.5 MHz in 4 bands, AM-CW, with plug-in tuner, Communications Company, Inc
RDG	Surveillance receiver, 0.5-30 MHz (modified HRO Jr. w/ sweep tuning and panoramic output), 117 V, 1944. Coilsets include CNA-47580, 0.54-0.9 MHz, -47581, 0.9-1.7, and -47411, 1.7-3.5.
RDH	Surveillance receiver, 91074, 1944
RDM	Receiver, triple diversity, fixed-station, 0.54-32 MHz, six bands, three RCA AR-88s (CRV-46246B), 91061, 1939
RDO	Radar search receiver, 38-1000 MHz (3 plug-in tuning heads for 38-95, 74-320, and 300-1000 MHz), like AN/APR-4, CPR-46ABC, Raytheon, 12 V, or 6V and 250V supplied externally.
RDP-A	Panoramic adapter, 91259
RDR	Receiver, part of MAR UHF radio or usable by itself, 225-390 MHz, 10 xtal chans., 30.2 MHz IF, remote-controllable, 12 or 24 V, depending on model; or external power, 900841
RDZ	Receiver, shipboard, 225-400 MHz, 15.5 MHz IF, manual tuning or 10-channel autotune, Collins and National, usually paired with TDZ, 1944, 150 lb.; RDZ-A, 91229. Began as XCS.
REA	Receiver, 4.5-22 MHz SSB, fixed-station, triple diversity, independent sideband, WE Co. D-99945, works with TEF transmitter. Part of AN/FRC-10.
REE	Receiver, 0.54-18.6 MHz in 4 bands, Scott SLRM, AC-DC version of RBO with BFO added, 1944

REJ Panoramic adapter, 91217
REK Receiver, 0.54-32 MHz in 6 bands, 117 V, CRV-46246
REN Sonobuoy receiver
REZ Panoramic adapter
RGU Aircraft and ground radio
RUQ Receiver, 108-152 MHz, AM, single chan., Collins, ca. 1950
RVA Receiver, VHF fixed-tuned, Collins, 1950
RXA Multicoupler, 4.0-24 MHz, Mission Bell, 117 V

S(*) - GENERAL SEARCH-RADAR EQUIPMENT

SA Radar, first fleet type, 200 MHz, RCA, 1941
SC Radar, main fleet, 175-225 MHz, 1942; 100 kW (SC-1), 250 kW (SC-2, 3), 2 MW (SC-4); SC-6, 900860, 1942; SC-8, 91219; SC-12M, 91051
SD Radar, submarine search, 114 MHz, 149 kW, RCA, 1942. SDB model also.
SE Radar, first Navy S-band search, for small vessels, WE, 1942
SF Radar, S-band (2965-3019 MHz), 80 kW, for PT boats and other small craft, Raytheon, ca. 1942
SG Radar, first fleet S-band, 50 kW, 1000 built 1942-43; SG-1 transmitter, 52ABE-1; receiver, 46ABD-3, SG-6, 900861, 1943, GE/Raytheon
SH Radar, S-band search, WE, 1941
SJ Radar, submarine, S-band surface search and torpedo control (2965-3019 MHz), GE/WE, 1942. SJ-1 also known as Mk 27.
SK Radar, improved fleet, 212.5-222.5 MHz, 1941; SK-1M, 175-225 MHz, 1 MW, GE
SL Radar, 10-cm search (2720-2890 MHz), GE/WE, 1942. Variant: SLX (designed but not built; SL-1, 1943..
SM, SN Radars, shipboard, ca. 1943
SO Radar, 6275-6574 MHz, 250 kW, 2J27 magnetron, Raytheon, 1942; SO-1 and -8 receivers, 46ACA; SO-12M, 9.0-9.16 MHz, 91053
SP-1M Radar, mobile shore air-defense, 2700-2900 MHz, 700 kW, CG-46ADF, USMC version of Army SCR-584
SQ Radar, shipboard S-band, ca. 1943
SR Radar, fleet, 175-225 MHz (550-660 MHz for SR-2, 1244-1350 MHz for SR-3), 500 kW, 900946, 1944; SR-6A, 900989; SRA, 900946, RCA /WE/Westinghouse
SS Radar, X-band submarine, surface search and torpedo control, developed from SJ, 1944; SS-1, 91281, SS-2, 1952
ST Radar, submarine, surface search and torpedo control, range-only, 8800 MHz, 85 kW, small antenna mounted on periscope, uses periscope tubing as waveguide, WE, 1944
SU Radar, X-band, Submarine Signal Co., 1944; SU-1, 1944
SV-1 Radar, submarine aircraft-warning, S-band (3460-3760 MHz), 900825, WE/Raytheon, 1944-45; SV-3, 1950
SX Radar for fighter control, S-band (2780-2900 MHz, but height-finder subsystem uses 3500-3550), 1 MW, 1945; SX-1, 91177; GE/WE

T(**) - TUBE-TYPE RADIO TRANSMITTERS

TA	Transmitter, 1.5-2.3 MHz, 5 W, ca. 1920
TB	Transceiver, 0.6-1.0 MHz, 5 ch., 5 W CW, ca. 1920
TC	Transmitter, 0.59-0.74 MHz, 5 ch., 150 W, AM-CW-MCW, GE, 1920
TD	Transmitter, 0.1-0.6 MHz, 7 ch., 1500 W, AM-CW-MCW, GE, 1920
TE	Transmitter, 0.3-0.6 MHz, 5 ch., 300 W, AM-CW-MCW, GE, 1920
TF	Transmitter, 0.2-0.6 MHz, 7 ch., 300 W, AM-CW-MCW, GE, ca. 1921
TG	Transmitter, 0.3-0.6 MHz, 5 ch., 300 W, AM-CW-MCW, GE, 1921
TL	Transmitter, 0.2-0.6 MHz, 6.5 kW (former spark type), for battle-ships, 1922
TM	Transmitter, 100 W, submarine use, ca. 1923
TN	Transmitter, 6 kW, shore stations, 1923
TO	Transmitter, 0.5-1.5 MHz, 100 W, battleship use, 1923
TP	Transmitter, 75-600 kHz, 150 W, WE, 1923
TU	Transmitter, 0.2-0.4 MHz, 2 kW, GE, 1923
TV, TW,	
TX	Intrafleet transmitters, 2-3 MHz, 1925
TAB	Transmitter, 0.1-0.555 MHz, CW-MCW, CAY-3438, models through TAB-4
TAD	Transmitter
TAF	Transmitter, 2-18 MHz, 1930
TAJ	Transmitter, 0.3-0.6, 3-4.8, and 7.7-12 MHz, CW-MCW, 500 W, 900428, 1930, models through TAJ-19, RCA et al.
TAO	Transmitter, 1930
TAQ	Transmitter, 0.175-0.6 MHz, CW-MCW, 1 kW, 1930, models through TAQ-10
TAR	Transmitter, 0.3-0.6 and 4.0-18.1 MHz in 3 bands, 200 W, xtal, 1929
TAV	Beach-landing party transmitter-receiver, receives 0.3-0.6 and 2.0-4.525 MHz, sends 2.0-4.525 MHz, xtal calibrator, NESCO, 1930, 50 made; later models through TAV-2
TAW	Transmitter, 15-34 kHz, 300 kW, GE
TBA	Transmitter, 4.0-26 MHz CW, 1 kW, GE, powered by 440 V 3 phase, 900290, 1930, models through TBA-13
TBB	Transmitter, 4.0-26 MHz, 6 chans., 1 kW, GE
TBC	Transmitter, 4.0-26 MHz, 40-50 kW, GE, 230 V 3 phase power, 1930
TBF	Transmitter, 2.0-4.525 MHz, 500 W, RCA, 1933; TBF-A is CAY-52008A, 2.0-18.1 MHz.
TBG	Transmitter, like TAR, 1933; TBG-1, 91167
TBH	Transmitter, RCA, 91118, 1933
TBJ	Transmitter, 15-34 kHz, 500 kW, RCA, 1934
TBK	Transmitter, shipboard including submarines, 2-18.1 MHz, 500 W CW-MCW-AM, 900388, ca. 1934, Westinghouse/RCA, models through TBK-20
TBL	Transmitter, like TAR, 0.175-0.6 and 2.0-18.1 MHz, 200 W CW-MCW-AM, Westinghouse/RCA, 900373, 1935
TBM	Transmitter, 2-18.1 MHz, 500 W CW, CAY-52169, used with CAY-

	50065 modulator, WE also
TBN	Transmitter, 0.2-2.0 MHz in 6 bands, 1 kW, CW-MCW, CAY-52046, 1934. TBN-3 covered 2.0-18.1 MHz in 2 bands, 500 W, CAY-52048
TBO	Transmitter-receiver, sends 2.0-3.5 MHz, receives 2.0-8.0 MHz, hand-cranked or 12 V dynamotor, GE
TBP	Transmitter, 28-65 MHz
TBS	Receiver and transmitter, 60-80 MHz, 50 W AM-MCW, RCA, for intership voice use, 1938, models through TBS-8. Motor-generators were available for 120 VDC, 120 VAC, 230 VDC, 440 VAC.
TBU	Transmitter, 0.3-2.0 MHz, 1 kW CW-MCW, CAY-52223, powered from 234 or 220/440 V, 900384, 1939
TBW	Two-transmitter set, 0.35-1.0 & 3-18.1 MHz, 100 W CW, 25 W AM-MCW, U/W RBM in MM station. Similar to GO-9. Main components of TBW-3 are 20084 rectifier PS; 21648 motor generator, 60 Hz; 21652 motor generator, 25 Hz; 52238 HF transmitter for 12 V; 55239 LF transmitter for 117/234 VAC; 73004 gas engine generator.
TBX	Receiver-transmitter, receives 2-8 (1515 kHz IF), transmits 2-5.8 MHz (2.0-4.525 in TBX-1 to -3), 9 W CW, 3 W AM, hand gen., uses external crystal calibrator, models through TBX-8. Components include 21263 hand generator and 43060 R-T unit. Receiver is powered by dry batteries; transmitter, by 12 V and 500 V. Set is comparable to Army SCR-694 (BC-1306) or RT-77/GRC-9. Models through TBX-7. GE/Hazeltine
TBY	Receiver-transmitter, USMC portable, 28-80 MHz, 0.5 W AM-MCW, originally Westinghouse civilian model HR, 1941-43, uses dry-battery, wet-cell (with CAY-20144 vibrator pack), or AC power, models through TBY-8 made by Colonial et al. Uses electrically separate transmitter (push-pull 958As) and receiver (acorn-tube superregen with RF stage). Components include 21263B TBY-8 hand-cranked generator.
TCE	Transmitter, 0.35-9.05 MHz, 125 W CW-MCW-AM; similar to GP and shares tuners with it. Westinghouse, CAY-52129.
TCG	Transmitter, 50-150 kHz, 50 kW CW, GE
TCJ	Transmitter, GE
TCK	Transmitter, fixed-station, 2.0-18.1 MHz in six bands, xtal or VFO, 400 W CW or 100 W AM from parallel 813s. Requires external power unit. TCK-7, 900210
TCL	Transmitter, 30-42 MHz
TCM	Transmitter, 2.0-18.1 MHz, 125 W CW-MCW-AM, GE
TCN	Transmitter, 0.3-2.0 MHz, 125 W CW-MCW-AM, GE
TCO	Radiotelephone, Radiomarine, 2.0-3.5 MHz, 6 chans., 117 V, 900885, 1943
TCP	Transmitter, 2.0-3.0 MHz, Radiomarine, 3 models: CRM-43009 32 V), CRM-43010 (117 VDC), CRM-43011 (117 VAC), 900868, 1943
TCR	Radiotelephone, Radiomarine
TCS	Transmitter and receiver, shipboard or portable, 1.5-12 MHz, 15 W AM, 25 W CW, 4 xtal chans. or tunable, 3 bands, 117 VAC PS, remote-controllable, Collins 18-Q transmitter & 51-Q receiver. Also

made by Capehart-Farnsworth. Components include:

20218 rectifier PS	21827 motor-gen., 230 VDC
20309 rectifier PS (alternate)	21881 dynamotor, 12 V
21100 motor-generator, 117 VDC	23270 remote control
21775 motor-generator, 32 VDC	46159 receiver
21776 motor-generator, 117 VDC	47205 antenna loading coil
21777 motor-generator, 117 VAC	52245 transmitter
21826 motor-generator, 24 VDC	66040 whip antenna
MCH-34, 35, 36, USMC cases	

Variants include TCS-2, as above, 12 V; TCS-5, 1.2-1.5 MHz; TCS-12 (the most common version); TCS-13, Hamilton, 1943

TCU	Radio set, GE
TCY	Transmitter, life-raft, 500 kHz, 5 W MCW, automatic "SOS" or hand keying, hand-cranked, like BC-778, Federal, 1943. Replaced by AN/CRT-3, which added alternating 500-8264 kHz operation.
TCZ	Transmitter, 0.2-1.5 and 2-18 MHz, COL-52286A, appears to be same as ATC or T-47/ART-13 as equipped with the LF oscillator, 900854. Uses COL-23410 remote control, COL-47230 antenna loading coil, COL-47505 tuning unit (0.2-0.5 MHz), and COL-48628 antenna shunt capacitor.
TDB	Transmitter, 2.0-22.1 MHz in 4 bands, xtal or MO, 200 W CW-MCW, Radiomarine
TDD	Transmitter, 0.2-0.55 MHz, 15 W AM, 117 V, Communications Co., Inc.
TDE	Transmitter, ship & shore, 0.3-18.1 MHz, 125 W CW, 35 W AM-MCW, CAY-52267, 900887, 1942
TDF	Radiotelephone, 2.0-9.4 MHz, 6 xtal chans., 125 W CW-MCW-AM, Radiomarine and Raytheon
TDG	132-156 MHz, 12 W, CW-52366, U/W RBQ
TDH-4	Transmitter, 2.0-18.1 MHz, 11 chans., MO, 3 kW CW-AM, COL-52291, TM 11-848, 1944



TCZ (COL-52286A) transmitter

TDJ Transmitter, Collins
TDN Transmitter, 2.0-5.16 MHz (CIL-52294) or 13.0-20.0 (Press Wireless 52296), xtal, 3 kW CW, 117 V
TDP LORAN-A navigation transmitter, 1.8 MHz, 100-kW pulses
TDQ Transmitter, 115-156 MHz, 45 W AM, 4-chan., 900474, used with RBQ in shore stations for point-to-point links, RCA, 1944
TDR Transmitter, 225-400 MHz, 10 chan., 25 W AM, CG-52336, 117 V
TDU Transmitter, 0.3-2.0 MHz in 7 bands, 1 kW CW-MCW, CAY-52123
TDY Radar jammer, 116-770 MHz (later 170-1250), 150 W, CG-35ABC and -35ABL, using dipole antenna, 1944. TDY-A, CRP-35ABV, covers 2700-3300 MHz, 150 W, using horn antenna
TDZ Transmitter, 225-400 MHz, 10 xtal chans., remote-controlled, 30 W AM, paired with RDZ, 900809, RCA and Capehart-Farnsworth, 1944; TDZ-A, 91284
TEA Radar jammer, 15-54.5 and 40-120 MHz, 2 kW, CAY-50AFD, 1944
TED Transmitter, 225-400 MHz, xtal, 15 W AM-MCW, CAY-52373B
TEF Transmitter, 4.5-22 MHz, six preset chans., ca. 2.5 kW, independent-sideband, fixed-station, WE D-156000, operates with REA receiver. A component of AN/FRC-10.
TEG Transmitter, ship or shore, 0.2-18.1 MHz, 100 W, CRV-52372
TEH Transmitter, 1.7-2.0 MHz, 4 xtal chns., 1 kW CW, GE, 234 V
THV-1 Transmitter, HF, Bunnell, 1945
TLC Transmitter, LF, CW, Bunnell, 1942
TLG Transmitter, LF, AM, Bunnell, 1947
TPA RF amplifier, 4.0-22 MHz, 50 kW

U(*) - GENERAL REMOTE CONTROL EQUIPMENT

UA Carrier telegraph system, 5 chans, RCA
UE Transmitter, LORAN, 1.7-2.0 MHz, GE, including CG-16239 receiver, 1943
UF Radio set control, SR-T equipment, 91070
UG Line terminal equipment U/W AN/MS-2, WE
UH Radio set control
UM Transmitter, LORAN, GE
UN Carrier telephone system, WE H1 single-channel, for open wire, 91261
UO Ciphony privacy system, CW-50293 et al.
UP Carrier telegraph system, 12 chans., standard tones (425-2295 Hz), WE
UX Mobile remote control equipment

V(*) - VISUAL RADAR PPI REPEATING EQUIPMENT

VC to VP Plan Position Indicator radar displays, later AN/SPA-4, 1943-44
VD-2 Radar display, 900933
VE Radar display
VF Radar display, Raytheon, 900858
VG-1 Radar repeater display, 91316

VH	Radar display, 900934
VJ	Radar display, Raytheon
VK	Radar repeater display, 900986; VK-2, 91300
VL	Radar display, 91075
VP	Also listed as audio oscillator, 30 Hz-15 kHz, 1 mW, CW-30585

W(*) - GENERAL SONAR RANGING-SOUNDING EQUIPMENT

WA	Combined Rochelle-salt (R-S) and magnetostriction equipment
WB	Combined Rochelle-salt equipment
WC, WD	Combined Rochelle-salt and magnetostriction equipment
WE	Combined lightweight magnetostriction echo-ranging equipment
WF	Combined ranging-sound sonic equipment
WCA-2	Sonar, mine detector, 13-37 kHz, ex-CXAX, COL-23521
WDA-1	Sonar, 13-37 kHz, Raytheon
WEA	Sonar, 17.5-25 kHz, Raytheon
WFA-1	Sonar equipment 91286

X(*) - GENERAL EXPERIMENTAL EQUIPMENT OF NAVY DESIGN**

XA	Transmitter, first xtal-controlled high-power fleet, 4-8-12 MHz, 500 W, 1925
XB	AC-powered version of XA for USMC, 1926
XC	Transmitter, 2.0-4.525 MHz, 1926
XD	Transmitter, shore-based high-power, 4-18 MHz ("Cornet"), 1926-27
XE	Transmitter, first submarine HF, 2-18 MHz, 750 W, screen-grid tube, 1928
XF	Transmitter, shore-station, 4-18 MHz, 5 kW, xtal, 1927; XF-1, ship-board version, 1929
XJ-1	Receiver, early VHF, 4-50 MHz, first use of shield-grid tube, 1929; XJ-2, 14-75 MHz, 1929
XK	Transmitter, for smaller submarines, 4-20 MHz, 75 W, xtal, 1929
XM	Receiver, DF, 0.075-1.0 MHz, 1928
XP	Transmitter, early VHF, 14-75 MHz, 500 W, 1929
XT	Radio, aircraft VHF, 52-60 MHz, 1930
XU	Monitor unit, 12-2500 meters, 1932
XV	Receiver, VHF, 42-100 MHz super-regen, 1932
XZ	Antenna duplex coupler
XAB	Receiver, DF, 2.5-30 MHz, became DT, 1936
XAE	IFF system, early, 1939
XAF	Radar, first fleet, 200 MHz, 15 kW, 1938
XAR	Improved XAF, with anti-jam features, 1941
XARD	Receiver, aircraft radar countermeasures, 1942
XAT	Radar, aircraft, early ASB, ca. 1942
XBF	Radar, shipboard search, 200 MHz, 500 kW, 1943
XBK	Spot jammer, early, 560-620 MHz, 1943
XCA	Spot jammer, early, 560-620 MHz, 1944
XCJ	Transmitter, missile countermeasures, 1944
XCS	Receiver, early version of RDZ, 1944

XCU	Radio, early version of ARC-19, 225-400 MHz, 4 W AM, 1944
XCV	Receiver, early version of DBU submarine radar-intercept set, 1944
XCY	Receiver, intercept-DF, submarine, 2.0-3.50 MHz (see DBV), 1944
XEV-1	Demux equipment, 91294
XDM	Transmitter, submarine rescue buoy SOS, 1947
XDAX	Transmitter (CFT-52369), 1.5-22 MHz, 3 bands, 5 W CW-MCW, 12 V
XRAQ	Antenna control unit

Y(*) - GENERAL NAVIGATIONAL & LANDING EQUIPMENT (GROUND)

YD-1	Marker beacon, 75 MHz, Air-Track/Collins, powered by engine generator or rotary converter
YE	Homing equipment for carrier aircraft, like ZB, 200-250 MHz, 50 W, CRV-52234, 1937
YG	Homing beacon, for carrier-based planes, 241-251 MHz, used with ZB, AN/ARR-1, AN/ARR-2
YH	Navigational radar beacon, ca. 1943
YJ	Navigational radar beacon, 500-530 MHz (possibly to work with ASB), Hazeltine, ca. 1943
YL	Homing equipment for landing craft, 246 MHz, 1942
YN	Beacon for YL unit, 1942
YR	Type-H beacon, 1020 Hz modulation, Air-Track, 900784, 1943

Z(*) - GENERAL NAVIGATIONAL & LANDING EQUIPMENT (AIRBORNE)

ZA	Instrument landing system (glide-path and localizer), 90-98 MHz, 14/28 V, CDE-46120 receiver and CDE-20109 signal converter
ZB	Homing adapter for carrier aircraft, using RF modulation (0.54-1.03 MHz) on 234-258 MHz carrier. Uses acorn tubes. ZB-3 is CW-69076. Redesignated AN/ARR-1, replaced by AN/ARR-2, 1937-44. Models through ZB-4.

ACKNOWLEDGEMENTS

Much of this material was excerpted from a large composite file compiled by Ray Mote. Portions of it were augmented by inspection of Navy equipment in the AWA Museum Annex and the Flemington Signal Depot.

REFERENCES

1. F. C. Chesson, "Signal Corps SCR-RC-BC Directory," AWA Review, Vol. 6, 1991, pp. 49-95.
2. F. C. Chesson, "Electronic Military Equipment - Naval Equipment Manufacturers," AWA Review, Vol. 7, 1992, pp. 69-89.

BIBLIOGRAPHY

Electronic Test Equipment, NAVSHIPS 93003, Vol. 1, Dept. of the Navy, 1957.
"Radio Set Technical and Descriptive Information," Electrical Communication Systems Engineering, TM 11-486, Dept. of the Army, 1945, pp. 361, 368, and 371-374.

L. S. Howeth, History of Communications-Electronics in the United States Navy (Washington: U. S. Government Printing Office, 1963).

L. A. Gebhart, The Evolution of Naval Radio-Electronics and the Contributions of the Naval Research Laboratory (Washington: U. S. Government Printing Office, 1981).

Achievement in Radio - 70 Years of Radio Science at the National Bureau of Standards (Washington: U. S. Government Printing Office, 1986).

Old Timer's Bulletin articles covering U. S. Navy equipment:

AN/APS-4	Vol. 31 No. 2, p. 47
AN/ARC-2	Vol. 33 No. 1, p. 16
AN/CPT-2	Vol. 33 No. 1, p. 13
AN/URT-22	Vol. 33 No. 1, p. 21
	Vol. 33 No. 3, p. 34
ARB	Vol. 31 No. 2, pp. 43, 53
	Vol. 32 No. 2, p. 31
ATB	Vol. 32 No. 1, p. 18
CG-1104A	Vol. 32 No. 2, p. 13
	Vol. 32 No. 3, p. 17
MRD-8 (BC-655)	Vol. 32 No. 2, p. 35
RAK/RAL	Vol. 30 No. 3, p. 24
RAS	Vol. 31 No. 3, p. 33
RAW, RBJ, RCE (HRO Jr.)	Vol. 26 No. 1, p. 33
	Vol. 28 No. 1, p. 16
	Vol. 24 No. 3, p. 12
	Vol. 25 No. 1, p. 14
	Vol. 32 No. 2, p. 44
RBO	Vol. 33 No. 4, p. 14
RCH (AN/SRR-3)	Vol. 33 No. 4, p. 16
RCK	Vol. 33 No. 4, p. 15
RDG	Vol. 32 No. 2, p. 46
REE	Vol. 33 No. 4, p. 16
SE-1012A	Vol. 21 No. 3, p. 29
SE-1420 (IP-501, GCR-5)	Vol. 22 No. 3, p. 14
	Vol. 23 No. 1, p. 23
SE-143 (IP-500)	Vol. 2 No. 3, p. 15
	Vol. 2 No. 4, p. 3
SE-1950	Vol. 28 No. 4, p. 14
SE-899	Vol. 4 No. 2, p. 6
SE-95A	Vol. 4 No. 1, p. 3
	Vol. 4 No. 3, pp. 9, 11
TCS	Vol. 30 No. 3, p. 15
TCY (BC-778, AN/CRT-3)	Vol. 31 No. 4, p. 17
VLF Receivers (SE-1617, RA-RO, RAA-RBL), Tabulation	Vol. 33 No. 2, p. 19
Naval Equivalents of Civilian	Vol. 32 No. 1, p. 14

Surplus Schematics Handbook (New York: Cowan Publishing Corp., 1960)

T. Johnson, "Naval Aircraft Radio," *Proc. IRE*, Vol. 8 No. 1 (Feb. 1920), pp. 3-58, and Vol. 8 No. 2 (April 1920), pp. 86-141.

M. D. Fagen, ed., A History of Engineering and Science in the Bell System - National Service in War and Peace (1925-1975) (Murray Hill, NJ: Bell Telephone Laboratories, Inc., 1978)

Frederick W. Chesson

Fred Chesson came to the Electron Art when he was 16, via a Tesla-coil construction article in the January, 1946 issue of "Popular Science." The Tesla coil was duly built, using such diverse parts as a surplus VT-25, a UTC power transformer from the Heath Company, an oatmeal box, and the bakelite base of a (now highly desirable) Kennedy battery radio. Some 40 years later the coil came from the attic to take third place in an AWA equipment contest.

He graduated from the University of Connecticut in 1952 with a BA in Physics, then worked as an electronics engineer for about 20 years before gravitating into technical writing. His historical interest in Navy equipment goes back to younger days, when he made elaborate equipment lists from the exciting pages of "Radio News" and "Radio Craft." Acquiring a personal computer made a data base of this information possible.

When not involved in arcane antiquities like a definitive listing of all known Navy



equipment, he does historical and travel articles, plus long-term research ranging from a study of Connecticut's war against tuberculosis, to Civil War ciphers and telegraph history, the lost iron industry, and various fiction projects.