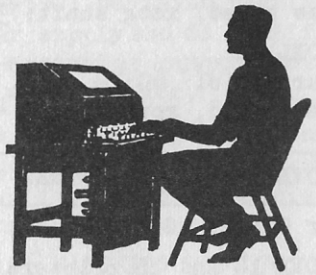
Amateur Radio-Teletype Society

4 4 3 WEST 4 7 STREET
NEW YORK 36, N Y

FORM 3547 REQUESTED



Charles Obert W1VIY
47 Morris Ave.
Trumbull, Conn.

BULLETIN of the AMATEUR RADIOTELETYPE SOCIETY

FEBRUARY - MARCH 1957

Published for all Radio Amateurs interested in Radioprinter, Radiophoto and Automatic Radiotelegraphy. Subscription rate: $3.00 for 12 issues to U. S. address or to Amateur Radio Call Sign foreign address.

EDITOR: Clay Cool W2EBZ

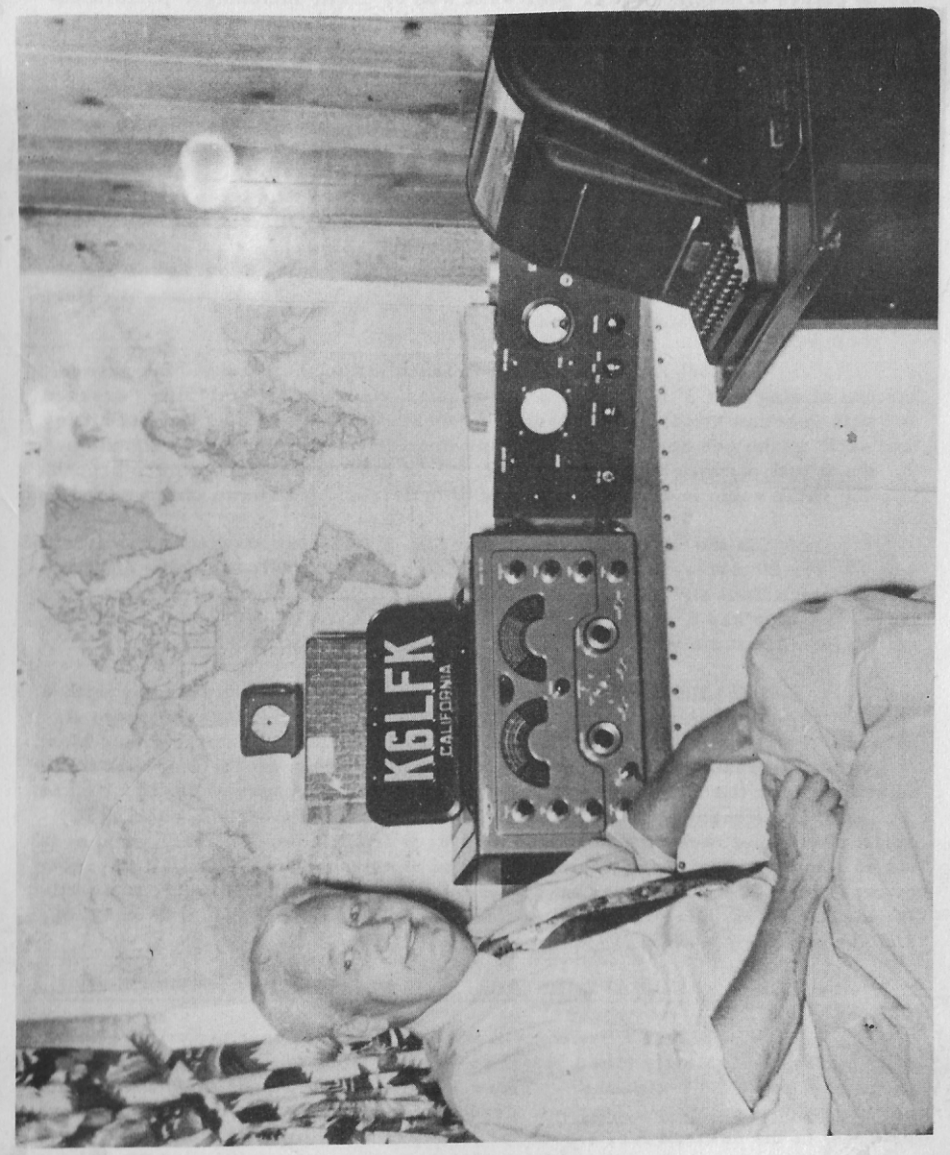
START-STOP TELETYPEWRITER CODE

CHARACTERS			CODE SIGNALS						
LOWER CASE	UPPER CASE COMM	UPPER CASE WEATHER	START	1	2	3	4	5	STOP
A	—	4							
B	?	⊕							
C	:	○							
D	$	↗							
E	3	3							
F	!	→							
G	&	↘							
H	STOP	↓							
I	8	8							
J	'	↙							
K	(	←							
L	)	↖							
M	.	.							
N	,	⊕							
O	9	9							
P	Ø	Ø							
Q	1	1							
R	4	4							
S	BELL	BELL							
T	5	5							
U	7	7							
V	;	⊕							
W	2	2							
X	/	/							
Y	6	6							
Z	"	+							
BLANK		—							
SPACE									
CAR. RET.									
LINE FEED									
FIGURES									
LETTERS									

NOTE: UPPER CASE H (COMM) MAY BE STOP OR #

SPACING PULSE — MARKING PULSE

ARTS 46



ANNIVERSARY CONTEST FIRST-PRIZE AWARD

Imagine K6LFK's surprise, upon returning to his North Hollywood home after a short vacation at Lake Tahoe, California, to find an official envelope bearing the monogram of the Amateur Radioteletype Society. Mort Swingler had submitted his photographic entry, among dozens of others, in the nationwide contest among RTTYers celebrating the tenth anniversary of the establishment of the national Amateur Radioteletype organization and the very first FSK and AFSK amateur radio teleprinter communication. Like all contest-minded radio amateurs Mort had participated for the fun of the competition and really did not believe he stood a chance to win an award, or even "honorable mention". You may well fancy his state of mind when he read the letter containing the announcement that he had been awarded First Prize by the contest committee. Several useful pieces of teletypewriter gear were won by LFK, including a perforated-tape synchronous-motored distributor. A spanking-brand-new Model 26-A has been shipped to him from the Society's headquarters at 38-06 61st Street, Woodside, N. Y. He also received a 14-type perforated-tape transmitter.

A retired Bell-System telephone man, K6LFK has been married eleven years and tells us that the XYL is not a ham. Despite his long association with electrical and electronic equipment Mort is not an old-timer in amateur radio, although he kept abreast of "ham" activities. Mort was bitten by the teletype "bug" less than two years ago but in the intervening time he has managed to accumulate a very respectable collection of gear. Among this collection can be found a Barker & Williamson 5100-B transmitter, 800-watt output power amplifier, 6-meter Gonsett and a National 183-D receiver. For mobile work Mort has a Multi-Elmac transmitter and receiver.

His 10' X 20' knotty pine finished shack, built behind the garage, has one sliding 8' X 2' window plus two regular windows, all tastefully "dressed up" with venetian blinds and drapes. For those contests that find the OM hitting the "sack" in the wee hours of the morning Radioteletyper Swingler has furnished the shack with a comfortable double bed. Both 110V and 220V lines are brought into the radio room and there are plenty of outlets and pull-down lamps wired up

In the "sky-wire" department the RTTY contest-winner has a Telrex 10, 15, 20 meter beam also a Multi-Match Antenna, FT-200 coils All-Band by Frederick Tool and Engineering Corp. Mort claims excellent results from these. He also has a vertical ground-plane antenna. A 60-foot tower is the beginning of what radiotyper Mort hopes will become an extensive antenna "farm".

K6LFK uses a telephone company "TWX" teletypewriter with a "home-brewed" terminal unit to convert the received machine-keyed audio signals into the DC pulses required by the telegraph printer. Contest-winner Mort is a voracious reader of literature on printing telegraphy, all the way back to the first article on the subject which appeared in QST in February of 1948. He has mulled over the many possible additions to his radioteletype station, such as auto-start, permitting reception of printed messages from fellow RTTYers when he is not at home; automatic reperforation in tape of message traffic and all the extra gizmos the radioteletype gang have been dreaming up. Mort Swingler is a well-rounded amateur. He finds time, besides his RTTY, to chew the "fat" on 'Phone and has given CW a whirl.

FREE TAPE DISTRIBUTORS FOR STATION PHOTOGRAPHS

Your RTTY Society will continue, until further notice, the policy of giving away absolutely free a Model 26-A perforated-tape distributor for good photographs of RTTY stations. These photos, or any resembling them, must not have appeared in publications elsewhere and are to become the exclusive property of the national RTTY Society. They must be mailed, well backed with cardboard, via insured mail, to the Society's headquarters offices at 38-06 61st Street, Woodside 77, N. Y. marked "ATTENTION of PHOTO EDITOR". Photos are preferably 8" X 10" or larger and, if at all possible, should be accompanied by the negative. Negatives alone are acceptable if you do not have large prints.

---------AVAILABLE----------

37 more Model 26 Teletype machines have been offered to our ARTS readers in a "combination deal" somewhat similar to the last one, bulletinized to the RTTY gang several months ago. These 37 typewheel page printers will be supplied through your national Amateur Radioteletype organization, complete with Keyboard, Typing Unit, Cover, Table and Model 14 Perforated-Tape Transmitter, for $93. They can be furnished only to radio amateurs or prospective radio amateurs who have on file at RTTY headquarters at 38-06 61st Street, Woodside 77, N. Y. a properly-executed copy of the "Waiver of Commercial Intent" (blank form supplied upon request). The "combination deal", engineered by your Society, for this batch and the previous similar one, obtains the printer-tape transmitter pair at a lower cost than they have ever been had before, from this or any other source. The $93 charge includes packing in stout wooden containers. They will be shipped from 4 locations, scattered around the country, in the next 2 or 3 weeks. Are you equipped for high-speed tape transmission?

---

27 Stroboscope Test units are now available, identified as Item 286, for $21. They are similar in appearance to the General Radio "STROBOTAC" units and have a similar application. The units consist of a cubical metal box, wrinkle-enameled, having a highly-polished parabolic reflector with a strobotron high-intensity flashing lamp at its focal point. A cord and telephone-type plug permits the stroboscope to be patched into teleprinter circuits. Through internal circuitry this allows the flash to be synchronized with the teletype signals and seemingly stops the high-speed mechanical parts of the printers and tape equipment or allows them to move at a snail's pace. The wire companies utilize them for locating stubborn troubles which only "act up" when the equipment is operating at standard speeds and cannot be seen when turning the mainshaft by hand. These 27, the first such instruments your Society has "liberated", will be delivered within a week or ten days after the last one has been "spoken-for" by our test-equipment-minded members.

---

350 Carrier Telephone and Carrier Telegraph Filter Inductors at $1.00 each. (furnished in minimum quantities of six). The Item 287 Filter Inductors are .75 Henries each and the Item 288 Filter Inductors are .95 Henries. An Item 289 Inductor contains a .005 built-in capacitor and is self-resonant with a sharp peak at 2550 Cycles, the mid-frequency between our standard MARK and SPACE tones. Until now the constructor of RTTY converters operating in the audio frequency range has had a choice of using several stages of low-Q coils or one or two stages of 88 Millihenry Toroida. Coils of the midget type unpotted from telephone loading coils. Few of us have had access to the other varieties of high-Q filter inductors; those employing laminations of Mu-Metal and special grades of iron and "Dust Cores" of iron and Permalloy powders. Also, although the physically-larger inductors demonstrate a higher Q, they have not hitherto been available to the Radiotypist. This has tended to stifle the filter-building enthusiasm of the RTTY gang. A large number of Carrier Filter Inductors of other values is scheduled for release in the near future. Your Society will publicize their availability when the happy day rolls around.

---

23 Damaged Bulletin Page Printers useful for parts at $12 each. Almost complete and contain motors, covers (glass windows broken on some), etc. The selector mechanism is similar to that used in Model 26 and several other Teletype machines. The polished black-painted base casting is broken on some. May be possible to build one perfect printer from two of these machines with enough spare parts left over to keep the regular station printer in repair.

NEWS FROM "DOWN UNDER"

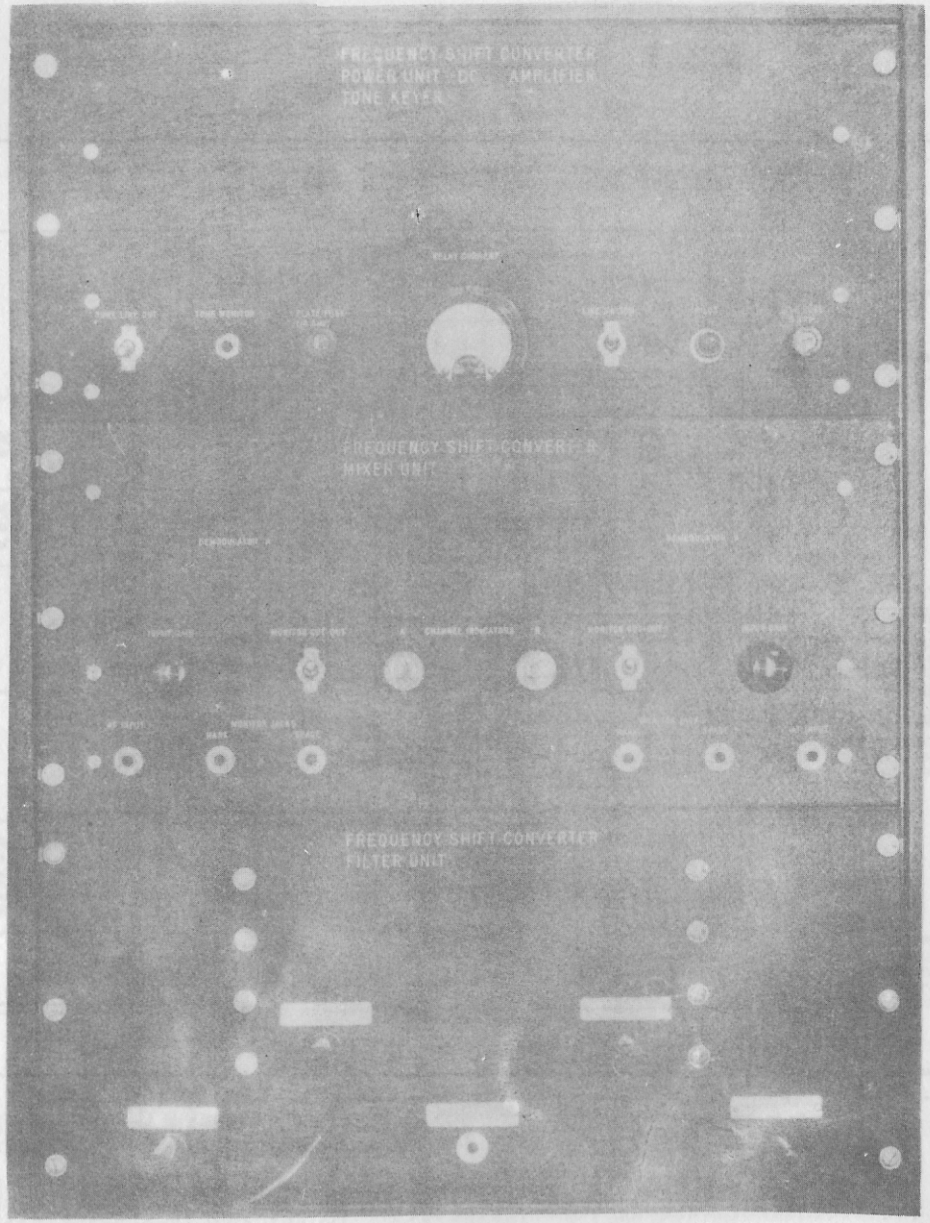
You must surely be thinking I have passed out of circulation, but not yet! I am glad to be able to tell you that I have now some FSK privileges, tho' not for 14 or 21 MC/S. These last 12 months have been vy trying, I have not had much success with our NZART - they appear vy adverse to FSK somehow. Ah me! For FSK we now have 3700-3800 KC, 7100-7200 KC, 26960-27230 KC & 29000-29700 KC. AFSK is available above 29700 KC "without restriction"! I trust you received my letters OK and that everything is going well with you people. At some later date I will write the Society at greater length on my RTTY activity - I shall not forget you.

Have worked Jack, W1BGW RTTY, MAB out - FSK in, on 14130 KC/S several times. Have enjoyed some 48 contacts with WØBP, W9DPY, W6AEE, W6CG, W6OWQ, W6WIS, W6FDJ, W6LDF, W6NYF, W9TCJ, W1BGW, W2JAV, VE7KX, WØWRO and W5HZF - all on 20 mtrs MAB1 (space only, which I found best) Rig 813 - 100 watts - 1/2 wave dipole - modified convertor, using 3 discriminator stages, or more rightly, selective amps., 6SN7s (vy similar revised W2BFD). Receiver R107, printers new 400-series, used 26. I have not succeeded in "procuring" any more of ur currency yet, but I hope one day to arrange a sub to ur fine ARTS bulletin. RTTY dope is very scarce down here (like most things!) & I value every item about it which I can rake up. Surely RTTY is a truly wonderful branch of Amateur Radio; indeed all good hams are RTTYers!

I'm hoping to acquire a governed motor to suit the 400 so that I can run it from a petrol plant away on vacation! I doubt if I will tackle RTTY as a mobile just yet though! Mayhap I could stabilize the petrol engine but.... its not a very smooth-running affair (750 w from an old NE gene). Have FSK VFO now on 1800 KC with doublers - was intended be VFO/XTAL beat type but FSK freqs different to my expectations! Operate 7100 & 27200 KC/S FSK & MAB on 20 mtrs as desired. Works OK, less QRM - but 20 is full of QRM! Vy 73 for present.

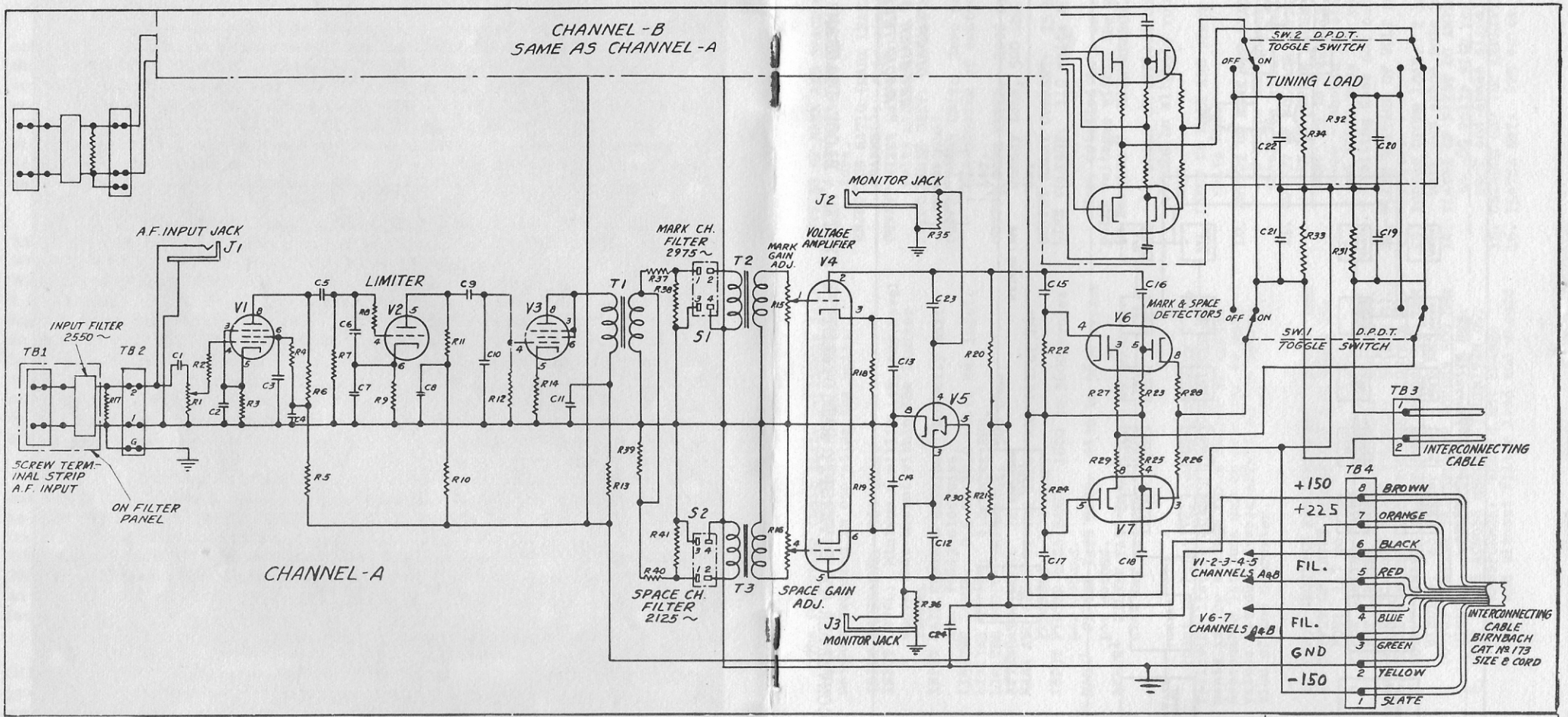
Bruce Rowlings, ZL1WB

(EDITOR'S NOTE:- Amateur Radioteletype Society is, naturally, immensely gratified that the long months of preparation to get this first printer to Oceania were so productive of results. We hope to be able to furnish many more DX RTTY contacts for our members. Correspondence with the Radio Amateur societies of practically every major country have been carried out by your RTTY headquarters for a number of years. In each case the moves are the same; a "go-getter" in the particular country is stimulated into action by the literature we furnish him and he goes to work on his national amateur group, government regulating body, etc. When privileges are obtained then the struggle usually centers around his ability, or rather inability, to obtain U.S. currency. The problem is an especially difficult one for countries in the "Sterling Area".)



MODEL FRS (FSC) FREQUENCY SHIFT CONVERTER

Panels, top to bottom, Power and Keyer Unit RW20345 (RW20340), Mixer Unit RW50212, and Filter Panel RW53215. This converter was designed as the FSC, later called the FRS.



RESISTORS

R1	10K POT.
R2	250K OHMS.
R3	330K "
R4	330K "
R5	100K "
R6	220K "
R7	2.2 MEG.
R8	22K OHMS
R9	22K "
R10	220K "
R11	390K "
R12	10K "
R13	820K POT.
R14	250K "
R15	2500 OHMS.
R16	1500 "
R17	1500 "
R18	1500 "
R19	20K "
R20	20K "
R21	125K "
R22	125K "
R23	125K "
R24	125K "
R25	125K "
R26	25K "
R27	25K "
R28	25K "
R29	25K "
R30	33K "
R31	125K "
R32	125K "
R33	125K "
R34	220K "
R35	220K "
R36	2000 "
R37	500 "
R38	1000 "
R40	500 "
R41	500 "

CONDENSERS

C1	.01 MFD. 600 V.
C2	.50 MFD. 50 V.
C3	.1 MFD. 600 V.
C4	.0025 MFD. MICA
C5	.500 MMF. MICA
C6	.02 MFD. 600 V.
C7	.5 MFD. 600 V.
C8	.006 MFD. MICA
C9	.5 MFD. 600 V.
C10	.01 MFD. 600 V.
C11	.01 MFD. MICA
C12	.25 MFD. 50 V.
C13	.25 MFD. 50 V.
C14	.25 MFD. 50 V.
C15	.05 MFD. 600 V.
C16	.05 MFD. 600 V.
C17	.05 MFD. 600 V.
C18	.05 MFD. 600 V.
C19	.01 MFD. 600 V.
C20	.01 MFD. 600 V.
C21	.01 MFD. 600 V.
C22	.01 MFD. 600 V.
C23	.01 MFD. MICA
C24	8 MFD. 450 V.

ARTS 46-6

MODEL FRS (FSC)
FREQUENCY SHIFT CONVERTER

MIXER UNIT, TYPE RW50212

BAND PASS FILTERS
(in RW53215 Filter Unit)

FIL1 2975 c D171119* or D2369#
FIL2 2125 c D171118* or D2368#
FIL3 2550 c D171120* or D2370#

*Western Electric Co
#Audio Devices Co

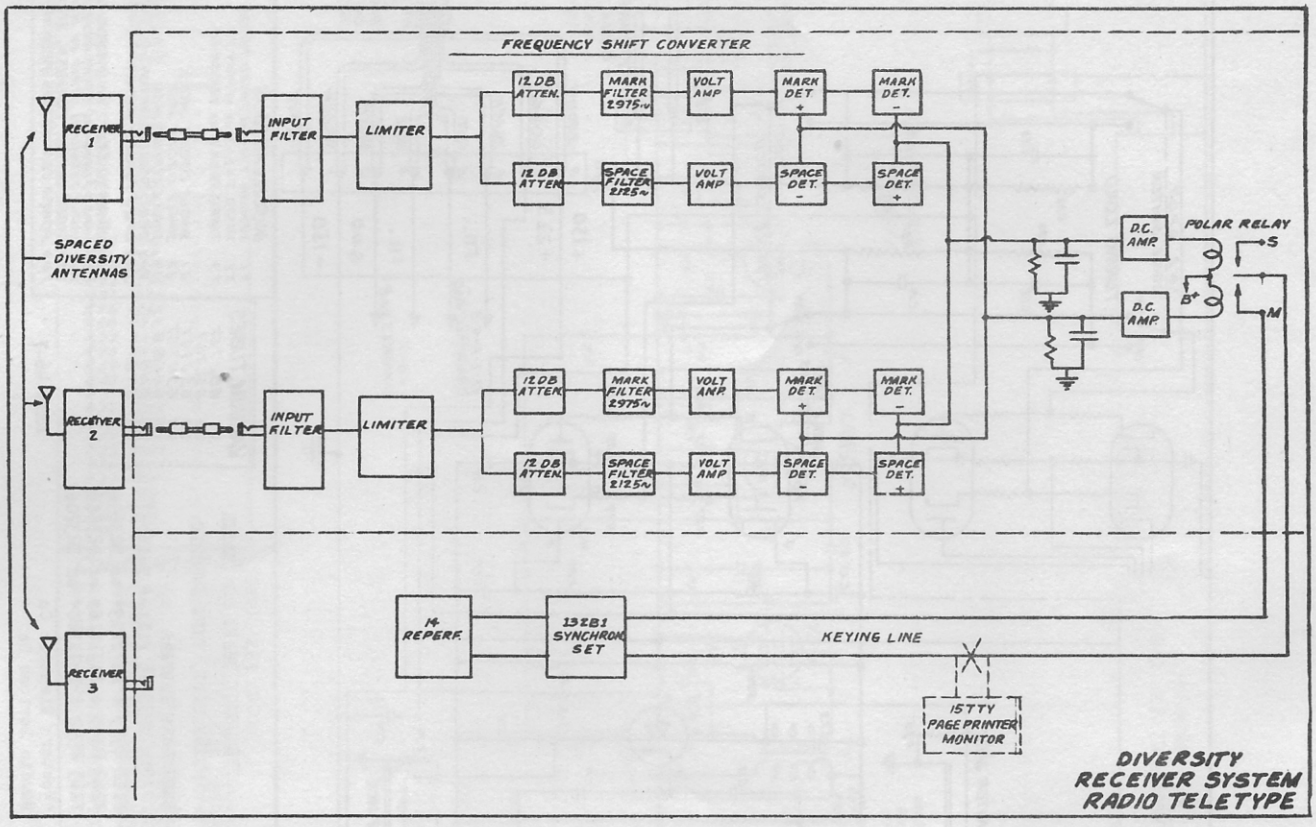
VACUUM TUBES

V1	6SJ7GT
V2	6SL7GT
V3	6SJ7GT
V4	6SN7GT
V5	6AF6G
V6	6H6
V7	6H6

ARTS 46-7

MISCELLANEOUS

T1	KENYON T105 or THORD. T61S25
T2	THORD. T63A71 or KENYON T5
T3	THORD. T63A71 or KENYON T5
J1	SINGLE CIRCUIT JACK
J2	SINGLE CIRCUIT JACK
J3	SINGLE CIRCUIT JACK
SW.1	DPDT. TOGGLE SWITCH
SW.2	DPDT. TOGGLE SWITCH
S1&2	JONES SOCKET (FILTER CONNECTORS)
TB1	INPUT TERMINAL STRIP ON FILTER PANEL.
TB2	INPUT TERMINAL STRIP ON MIXER UNIT.
TB3	DIODE OUTPUT TERMINAL STRIP
TB4	POWER CONNECTING TERMINAL STRIP.



FRS (FSC) CONVERTER IN DIVERSITY RADIOTELETYPE SYSTEM, BLOCK DIAGRAM

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Subscription rate: $3.00 for 12 issues in U. S. A. and to foreign amateurs.

Editor: Clay Cool W2EBZ

The following table lists pertinent data regarding the correct levels and impedance matches required in operating the unit.

INPUT IMPEDANCE: 500 ohms.
INPUT LEVEL: Minimum 6 milliwatts, any level above this amount within the limiter range.
INPUT GAIN CONTROL SETTING: Normally maximum, fully clockwise.
LIMITER RANGE: 0.5 to 30.0 volts RMS input.
LIMITER OUTPUT: 4.0 volts RMS.
LIMITER OUTPUT IMPEDANCE: 500 ohms.
ATTENUATOR LOSS: 12 db.
MARK AND SPACE FILTER INPUT AND OUTPUT IMPEDANCES: 500 ohms.
INPUT FILTER PASS BAND: 1600 to 3600 cycles per second.
MARK[1] FILTER PASS BAND: 2400 to 3600 cycles per second.
SPACE[1] FILTER PASS BAND: 1600 to 2600 cycles per second.

Point to Point Voltage Measurements - The following listing of point to point measurements is the average for a number of units. Reasonable latitude may be expected in most values without adverse effect on the operation of the Converter.

1. INPUT REQUIRED FOR LIMITING: .5 volt RMS.
2. OUTPUT OF INPUT FILTER FOR 2.0 VOLTS INPUT: 1.7 to 1.8.
3. FIRST LIMITER PLATE VOLTAGE: 45 (pin 8).
4. FIRST LIMITER SCREEN VOLTAGE: 35(pin 6).
5. SECOND LIMITER PLATE VOLTAGE: 50(pin 5).
6. THIRD LIMITER PLATE VOLTAGE: 100(pin 8).
7. OUTPUT LIMITER TRANSFORMER ACROSS 500 OHM WINDING: no filter load - 4.0 RMS.
   OUTPUT LIMITER TRANSFORMER ACROSS 500 OHM WINDING: with filter load - 3.8 RMS.
8. WAVE SHAPE ACROSS SECONDARY LIMITER OUTPUT TRANSFORMER: should not change with and without filter load and should be clean of reflections. Wave shape should be slightly rounded "Square" wave.
9. INPUT TO MARK AND SPACE FILTERS: 1.5 volts RMS.
10. OUTPUT OF MARK AND SPACE FILTERS: .75 to .65 volts RMS (check with scope - should be sinusoidal)
11. OUTPUT OF VOLTAGE AMPLIFIER MEASURED AT MARK AND SPACE JACKS WITH POTS AT MAXIMUM: 35 to 40 volts RMS (check with scope - should be sinusoidal when mark and space pots are reduced so that limiting does not occur).
12. PLATE VOLTAGE OF VOLT AMPLIFIER: 125 volts.
13. ACROSS DIODE LOAD: ± 12 volts DC with mark and space pots maximum.
14. PLATES OF FIRST DC AMPLIFIER: Swings 0 to -80 volts with respect to ground for mark and space signals (pins 2 and 5).
15. CATHODE 6N7 (DC AMPLIFIER): Minus 50 volts
16. PLATES 6N7: 225 volts (pins 3 and 6).

SETTING OF MARK AND SPACE GAIN CONTROLS: For ± 10 volts DC across diode load resistors.
REJECTION RATIO (MARK LEAKAGE THROUGH SPACE CHANNEL): Approximately 22 db down.
OUTPUT MIXER UNIT: 10 volts polar DC (4 volts minimum).
INPUT POWER UNIT: 10 volts polar DC (4 volts minimum).
OUTPUT POWER UNIT: Zero potential, opening and closing of contacts on output relay.
OUTPUT TONE KEYER: 1000 cycle audio frequency tone, 500 ohm impedance, + 12 db.
OUTPUT RELAY CURRENT: 15 milliamperes.
LINE VOLTAGE: 110 volts AC, 60 cps.

More detailed data on actual point to point voltages within the unit are contained in Section V - MAINTENANCE.

This space reserved for news. You send it in and we will print it.

MODEL FRS (FSC) FREQUENCY SHIFT CONVERTER

Weight, about 150 lb.

Cabinet RW10420, 28" h x 21" w x 15" deep.

Mixer Unit RW50212 contains 2 identical de modulators to separate mark and space tones and combine the receiver outputs at dc.

Power and Keyer Unit RW20345 (RW20340) contains regulated power supply and dc amplifier for operating output relay, and a Tone Keyer.

Filter Panel RW53215 contains input, mark, and space filters for each demodulator channel.

Manual: NAVSHIPS 900,078

Model FRS(FSC) Frequency Shift Converters demodulate FSK RTTY signals. It operates at audio frequencies, and may be used with any stable communications receiver with BFO. FSK, employing current limiting and AVC and with frequency and space diversity provide an improvement of 40db over a make-and-break telegraph channel.

THEORY. Block diagram shows arrangement of receiving system. Receivers are fed by directional antennas, such as fishbones or rhombics, spaced 6 or more wavelengths apart.

Mixer Unit has 2 identical demodulator channels up to the point of combining the detector output. Tones are fed into the input filter, which has bandpass of 1600 to 3600 c. The two tones are then fed to limiters. The constant output of limiters is fed thru isolating attenuators to mark and space filters. A stage of voltage amplification after filters drives the rectifiers. The mark and space rectifiers give d-c across the load of opposite polarity. The polar d-c output of the mixer unit feeds the d-c amplifier in the Power and Keyer Unit. (See ARTS 47 for schematic and theory of RW20345 Power Unit.)

Kleinschmidt Labs., Inc has been acquired by Smith-Corona, Inc.

K2RTF ...am using a 522 and model 12. I work as a technical writer... Arthur Marko

MENTION YOUR CALL SIGN when writing.

The SOCIETY reserves the right to refuse or cancel membership. For (1) conduct unbecoming an amateur, (2) conduct detrimental to the society or amateur RTTY, or (3) other reasons deemed sufficient by officials of the SOCIETY.

Some Multiplex Auto Controls Type 1A have become available. Now what are the things good for???

K2CSI is getting out on 2M with a 26. Joe is active in Yonkers, N Y CD.

THIRD ANNUAL IRE-TT NYC DINNER

The TT dinner will be held on Monday evening, March 18, 1957. Please indicate if you plan to attend so the committee can complete plans, and so that you will be notified of the final details.

SSB IRE DINNER 1957

The SSB dinner will be held Tuesday, 19 March 1957 at the Hotel Shelbourne, 37th St and Lexington Ave, New York City. Contact W2AMB, Fred Huff for details and reservations.

TRANSISTORIZED FORK STANDARD

A few 435 c forks are still on hand for $2 postpaid. These can be filed to 425 c for a telegraph standard, such as described in ARTS 41. Also, an article covering a transistorized standard giving outputs of 2125 and 2975 is in ELECTRONICS, Feb. 1, 1957, on page 196. This shows W2JTP's standard. With a scope, 425 c can be used to measure 85, 170, 850, 2125, 2550, 2975 c, etc.

NORTHERN CALIFORNIA RADIO-TELETYPE SOCIETY, INC (NCARTS)

NCARTS has been formally organized. Initiation is $4, and dues $1 a year. Meetings every 2 or 3 months and a bulletin are planned. Present membership is over 50. President is W6FZC, vicepresident is W2EFT, and W6VPC is secretary-treasurer. Other board of director members: W6VVF, W6FDJ, W6NKP.

TELETYPE CORPORATION BUILDS

Teletype Corp plans to build a multimillion dollar center on an 105-acre site near Niles, Ill., Chicago suburb. Ground has been broken for a 500,000 sq ft plant. Also to be built are a 120,000 sq ft and a 170,000 sq ft administration are a 120,000 sq ft research center and a 170,000 sq ft administration building. The project will consolidate Teletype's operations in the Chicago area, now consisting of 7 plants and the main office at 1400 Wrightwood Avenue.

W2ANB, Slingerlands NY has his W2BFD panel in operation.

NYC AREA HAMS: Are you getting the NY/RTS NEWSLETTER? if you've been overlooked, yell!

1800 RPM SYNC MOTOR SPEED DATA

For nominal 368 operations per minute, signaling frequency is 22.7 dot cycles per second.

MODEL 14 and 15 printers and reperforators:
Gear ratio: 30:7
Free speed, rcvg shaft: 420.0

MODEL 14 transmitter-distributor:
Gear ratio: 44:9
Free speed, xmtg shaft: 368.2

MODEL 26:
Gear ratio: 60:14
Free speed, rcvg shaft: 420.0

GOVERNED MOTOR SPEED DATA

For Target 1G, 10 spots, 368opm

MODEL 14 and 15 printers and and reperforators:
Motor speed: 2102.4
Gear ratio: 35:7
Free speed: 420.5 rpm

MODEL 14 transmitter-distributor:
Gear ratio: 40:7
Free speed, xmtg shaft: 368.101

MODEL 26:
Target 107008M (35&6 spots) (adjust for stationary 35-dot target)
Motor speed: 1802.1
Gear ratio: 60:14
Free speed, rcvg shaft: 420.5

See ARTS 45-4 for speed setting.
