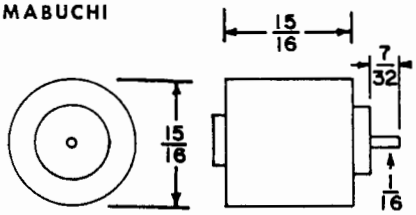
R/C Data

MOTOR FACTS

Ace R/C Inc.
HIGGINSVILLE, MO. 64037

MABUCHI



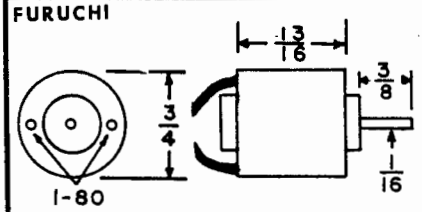
VOLTAGE	MA DRAIN	
	IDLE	STALL
1.2 V	23	140
2.4 V	30	270
1.5 V	22	150
3.0 V	30	280

WEIGHT 27.4 GRAMS

The Mabuchi motor has a direct output, no internal gear reduction. The output shaft is 7/32" long and 1/16" diameter. The housing is metal with no mounting holes provided but with care holes can be drilled and tapped in the case.

RESERVED

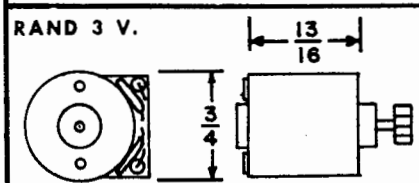
FURUCHI



VOLTAGE	MA DRAIN	
	IDLE	STALL
1.2 V	80	240
2.4 V	95	460
1.5 V	80	280
3.0 V	100	400

The Furuchi motor has a direct output, no internal gear reduction. The output shaft is 1/6" by 3/8" . It has two drilled and tapped holes for 0/80 bolts for mounting

RAND 3 V.

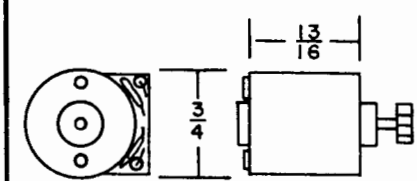


VOLTAGE	MA DRAIN	
	IDLE	STALL
1.2 V	50	125
2.4 V	70	250
1.5 V	60	130
3.0 V	75	260

WEIGHT 24.3 GRAMS

The Rand 3 Volt motor has a direct output, no internal gear reduction. The pinion gear and arc suppression on the motor furnished. 2/56 x 1/4" mounting bolts are provided.

RAND 1.5V.

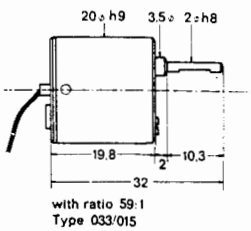


VOLTAGE	MA DRAIN	
	IDLE	STALL
1.2 V	60	200
2.4 V	70	330
1.5 V	60	200
3.0 V	70	360

WEIGHT 25.5 GRAMS

The Rand 1.5 Volt motor has a direct output, no internal reduction. The pinion gear and arc suppression furnished. 2/56 x 1/4" mounting bolts are provided

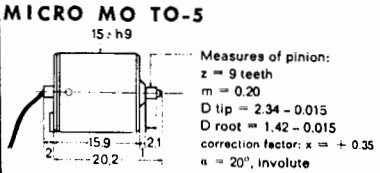
MICRO MO TO-3



VOLTAGE	MA DRAIN	
	IDLE	STALL
1.2 V	20	300
2.4 V	60	725
1.5 V	22	380
3.0 V	60	775

Diameter		20 mm
Length of casing		17 mm
Weight		20 g
Armature resistance	R_a	1,75 Ohm
Measuring voltage	U	2 V
No-load running speed	n_L	16700 rpm
Specific speed	n_s	8610/V.min
Starting torque	Md_k	12,70 cmp
Friction torque	Md_R	0,39 cmp
Specific torque	Md_s	11,40 cmp/A
Max. efficiency	η	69%
Armature moment of inertia	Θ	$4{,}85 \cdot 10^{-4}$ cmps²
Starting time constant	τ	$77 \cdot 10^{-3}$ s

MICRO MO TO-5



VOLTAGE	MA DRAIN	
	IDLE	STALL
1.2 V	12	210
2.4 V	18	420
1.5 V	14	260
3.0 V	24	380

Diameter		15 mm
Length of casing		16 mm
Weight		12 g
Armature resistance	R_a	4 Ohm
Measuring voltage	U	2 V
No-load running speed	n_L	16300 rpm
Specific speed	n_s	8450/V.min
Starting torque	Md_k	5,6 cmp
Friction torque	Md_R	0.2 cmp
Specific torque	Md_s	11,6 cmp/A
Max. efficiency	η	71%
Armature moment of inertia	Θ	$1{,}9 \cdot 10^{-4}$ cmps²
Starting time constant	τ	$57 \cdot 10^{-3}$ s

Slip-on reductor ratios: 41:1; 141:1

1 OZ. = 28.35 GRAMS

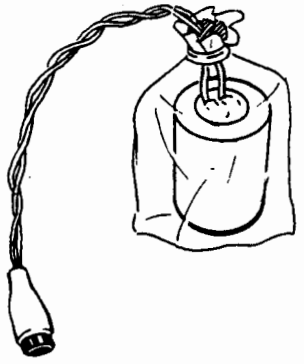
R/C Data

FREQUENCY FLAG COLOR STANDARD

The use of frequency flags has become mandatory in many flying areas. To assist all R/Cer's we present the color coding which seems to be the most universally adopted. The coding has been approved by the AMA Frequency Committee, and variations from it will be found to be local in nature.

26.995	Brown	51.20	Black/Blue	72.08	White/Brown
27.045	Red	53.04	Black/Violet	72.24	White/Red
27.095	Orange	53.10	Black/Brown	72.40	White/Orange
27.145	Yellow	53.20	Black/Red	72.96	White/Yellow
27.195	Green	53.30	Black/Orange	75.65	White/Green
27.255	Blue	53.40	Black/Yellow		
		53.50	Black/Green		

BATTERY PROTECTION AND INSTALLATION

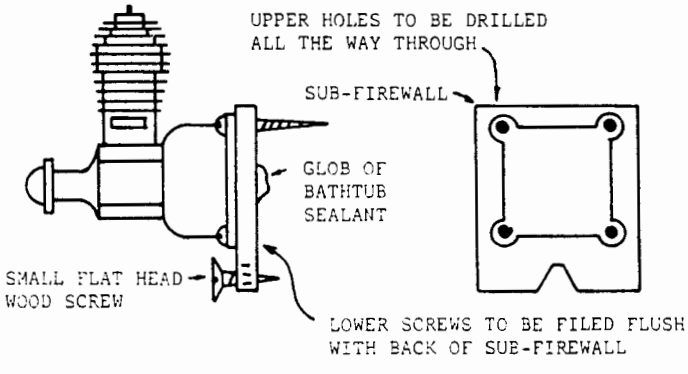


One problem that a small percentage of modelers seem to over-look, is proper receiver battery protection and installation. Most all of us at one time or another have had a fuel tank rupture and flood the battery compartment. The resulting mess leaves us frustrated and in a hurry to get it dried out and back in the air. Haste generally makes waste and everything ends up in the trash barrel! A simple solution to this is to first place your battery pack in a heavy plastic sack and wrap a rubber band around the end where the wires exit. Then to make sure you have complete protection, coat the wires in the area of the bag opening with G.E. Clearaseal or Dow Corning Silastic.

Battery damage can also result if the pack is mounted firmly against a bulkhead or fuselage wall. Continual motor vibration can cause the mechanical connection between cells to fracture, which results in all kinds of intermittent problems hard to locate. Continual vibrations can cause another mechanical failure of the nickel-ribbon straps routed along the side of the cells or an actual fracture of the strap. Either one of these failures can cause momentary or complete loss of control and yet the set will work on the bench. The best cure is an ounce of prevention. Wrap the battery pack with foam and make sure it is not pressing hard against fuselage walls or bulkheads.

--EK TECH TOPICS

MOUNTING IDEA

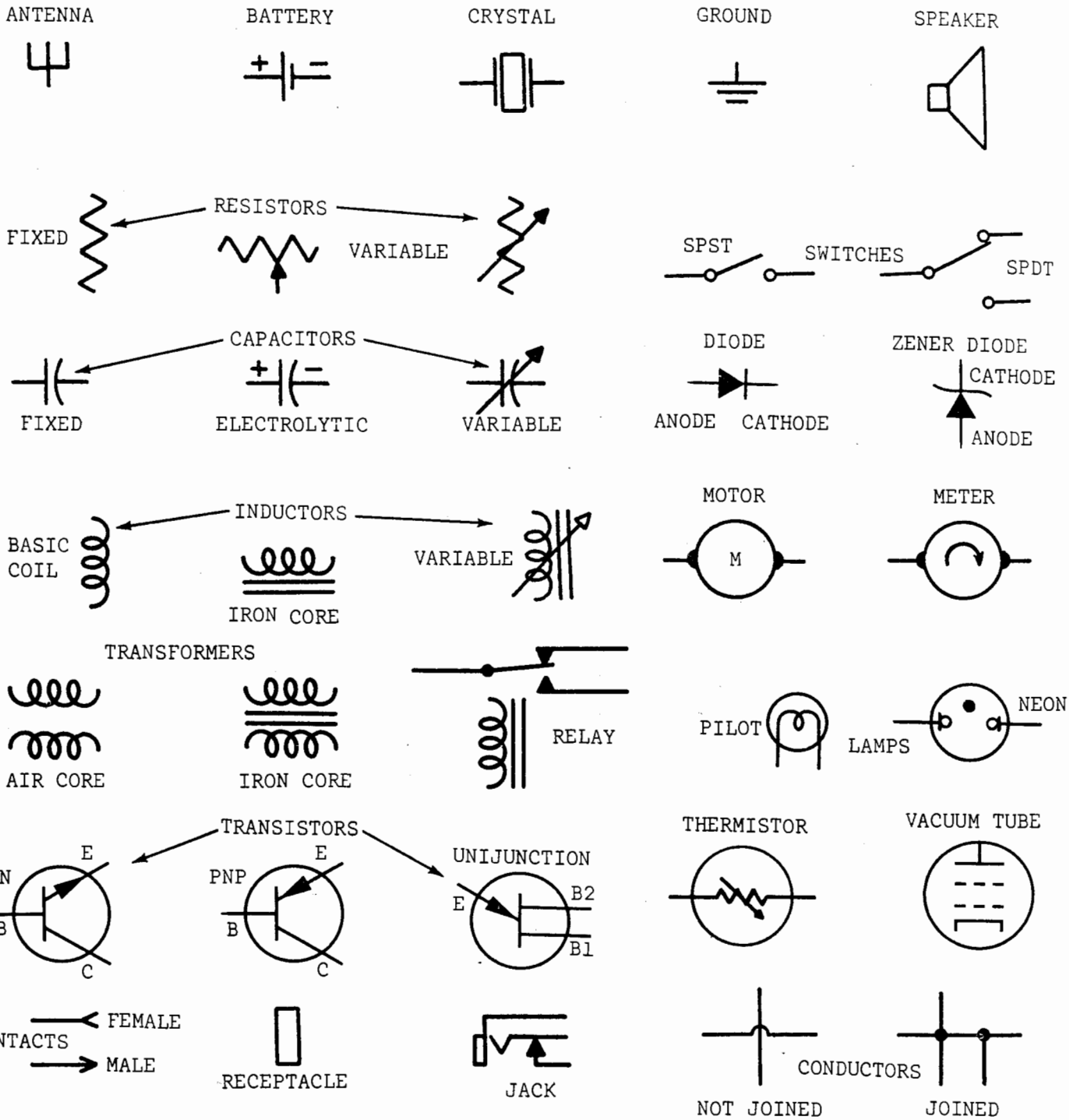


Here is a mounting idea for a Cox .020 Pee Wee in small planes. The unit as shown can be slipped down into place on flat head wood screws. The upper screws can then be tightened into regular firewall to obtain amount of side thrust desired. Size of glob determines amount of downthrust. I use wood screws for everything. The idea is quite simple to make. The engine can be removed in less than a minute for cleaning etc. I have used this same set-up on several small models with great success.

R. H. Pearson
Cassadaga, N.Y.

R/C Data

SCHEMATIC SYMBOLS



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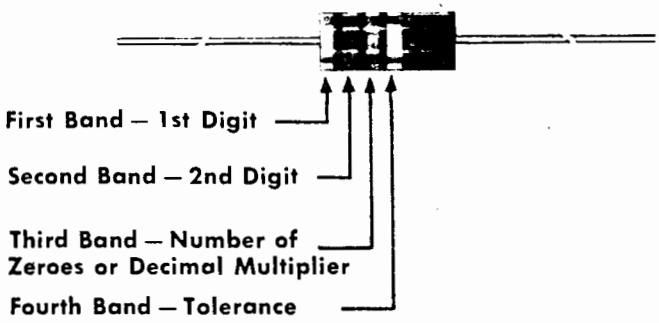
RESISTOR COLOR CODE



Color	Digit	Multiplier
Black	0	1
Brown	1	10
Red	2	100
Orange	3	1000
Yellow	4	10,000
Green	5	100,000
Blue	6	1,000,000
Violet	7	10,000,000
Gray	8	100,000,000
White	9	1,000,000,000
Gold	± 5% Tolerance	0.1
Silver	± 10% Tolerance	0.01
No Color	± 20% Tolerance	

METRIC EQUIVALENTS OF U. S. CUSTOMARY MEASURES AND WEIGHTS
(Based on National Bureau of Standards)

Length

Cm	=0.3937 in.	In.	=2.5400 cm
Meter	=3.281 ft.	Ft	=0.3048 m
Meter	=1.0936 yd.	Yd	=0.9144 m
Km	=0.6214 mile	Mile	=1.6093 km

Area

Sq cm	= 0.1550 sq in.	Sq in.	= 6.4516 sq cm
Sq m	=10.764 sq ft	Sq ft	= 0.0929 sq m
Sq km	= 0.3861 sq mile	Sq mile	= 2.590 sq km

Volume

Cu cm	= 0.06102	Cu in.	=16.387 cu cm
Cu m	=35.31 cu ft	Cu ft	= 0.02832 cu m

Capacity

Liter	=61.025 cu in	Cu in.	= 0.0164 liter
Liter	= 0.0353 cu ft	Cu ft	=28.32 liters
Liter	= 0.2642 gal. (U.S.)	Gal.	= 3.785 liters
Liter	= 0.0284 bu (U.S.)	Bu	=35.24 liters
Liter	= 1000.027 cu cm = 1.0567 qt. (liquid) or 0.9081 qt (dry) = 2.2046 lb of pure water at 4 C = 1 kg		

Weight

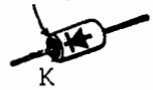
Gram	=15.4324 grains	Grain	= 0.0648 g
Gram	= 0.03532 oz avdp	Oz avdp	= 28.35 g
Kg	= 2.2046 lb avdp	Lb avdp	=0.4536 kg
Kg	= 0.00110 ton (sht)	Ton (sht)	=907.2 kg

Pressure

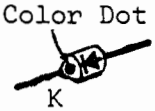
Kg per sq cm	=14.223 lb per sq in.
Lb per sq in.	= 0.0703 kg per sq cm
Kg per sq m	= 0.2048 lb per sq ft
Lb per sq ft	= 4.882 kg per sq m
Kg per sq cm	=0.9679 normal atmosphere
Normal atmosphere	= 1.0332 kg per sq cm = 1.0133 bars = 14.696 lb per sq in.

DIODE CODE

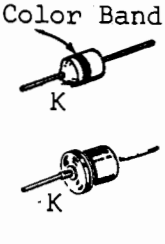
Color End



Color Dot



Color Band



DECIMAL AND METRIC EQUIVALENTS OF COMMON FRACTIONS OF AN INCH

Fraction	Decimal	Mm	Fraction	Decimal	Mm
1/64	0.01562	0.397	33/64	0.51562	13.097
1/32	0.03125	0.794	17/32	0.53125	13.494
3/64	0.04688	1.191	35/64	0.54688	13.891
1/16	0.06250	1.588	9/16	0.56250	14.288
5/64	0.07812	1.984	37/64	0.57812	14.684
3/32	0.09375	2.381	19/32	0.59375	15.081
7/64	0.10938	2.778	39/64	0.60938	15.478
1/8	0.12500	3.175	5/8	0.62500	15.875
9/64	0.14062	3.572	41/64	0.64062	16.272
5/32	0.15625	3.969	21/32	0.65625	16.669
11/64	0.17188	4.366	43/64	0.67188	17.066
3/16	0.18750	4.763	11/16	0.68750	17.463
13/64	0.20312	5.159	45/64	0.70312	17.859
7/32	0.21875	5.556	23/32	0.71875	18.256
15/64	0.23438	5.953	47/64	0.73438	18.653
1/4	0.25000	6.350	3/4	0.75000	19.050
17/64	0.26562	6.747	49/64	0.76562	19.447
9/32	0.28125	7.144	25/32	0.78125	19.844
19/64	0.29688	7.541	51/64	0.79688	20.241
5/16	0.31250	7.938	13/16	0.81250	20.638
21/64	0.32812	8.334	53/64	0.82812	21.034
11/32	0.34375	8.731	27/32	0.84375	21.431
23/64	0.35938	9.128	55/64	0.85938	21.828
3/8	0.37500	9.525	7/8	0.87500	22.225
25/64	0.39062	9.922	57/64	0.89062	22.622
13/32	0.40625	10.319	29/32	0.90625	23.019
27/64	0.42188	10.716	59/64	0.92188	23.416
7/16	0.43750	11.113	15/16	0.93750	23.813
29/64	0.45312	11.509	61/64	0.95312	24.209
15/32	0.46875	11.906	31/32	0.96875	24.606
31/64	0.48438	12.303	63/64	0.98438	25.003
1/2	0.50000	12.700	1/1	1.00000	25.400

TAP DRILLS AND CLEARANCE DRILLS FOR MACHINE SCREWS

Screw Size	Coarse Thread TPI	Coarse Thread Drill	Fine Thread TPI	Fine Thread Drill	Clearance Drill	Body Dia
0			80	3/64	52	.060
1	64	53	72	53	48	.073
2	56	50	64	50	43	.086
3	48	47	56	45	37	.099
4	40	43	48	42	32	.112
5	40	38	44	37	30	.125
6	32	36	40	33	27	.138
8	32	29	36	29	18	.164
10	24	25	32	21	9	.190
12	24	16	28	14	2	.216
14	20	10	24	7	D	.242
1/4	20	7	28	3	F	.250
5/16	18	F	24	I	P	.3125
3/8	16	5/16	24	Q	W	.375
7/16	14	U	20	25/64	25/64	.4375
1/2	13	27/64	20	29/64	29/64	.500

Ace R/C Inc.

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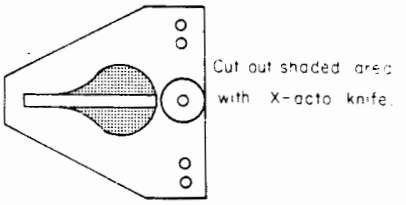
TAME YOUR TWITCH!

Want to smooth out the action of your plane when you are using two of the Rand actuators in a decoder system? This is probably the smoothest there is to date in the GG systems, but the following suggestion of contouring the Rand cam plate in each of the servos, as per sketch, will reduce the amount and duration of extreme control deflection during the go around. The only objection to this can be overcome with very light spring loading of the cam plate itself to reduce the "clanking" when the drive pin is out of the slot. In the air, control surface air loads accomplish this.



Rand rudder plate #6007

Don Dickerson
Florissant, Mo.

MIDWEST WING--EDGE-IT

The Morecraft Goodie Edge-Its have been used quite a bit in larger planes as protection for the leading and trailing wing edges. However, readers have written that they are also excellent for use with the Midwest Foam Wings on the Midwest Foam Float Kits. They are easy to apply, and are excellent protection against the pressure of the rubber bands. May be held with white glue if desired to hold on.

The Edge-Its are made of ABS plastic which will allow them to be shaped by placing in warm to hot water. Pre-formed they may be shaped for a better fit by the heat method.

EASY CONNECTOR CUSTOMIZING

Ever been frustrated when cutting a Deans 2-8 connector apart and lost one of your valuable connections? You can cut through a Deans connector quite simply and easily with just a razor blade if you will pre-heat the plug and socket! One of the simplest ways of doing this is to use a gooseneck desk lamp shoved close to the plastic of the connectors so that they get warm. Cut plug and socket separately with a single edge razor blade after they have reached enough heat to soften just a bit. Other methods of heat may also be used, such as heat lamps, etc. Care must be used so as to not get the connectors too hot, since too much heat will soften the plastic too much and cause a mess.

DO YOU HAVE A GOOD IDEA YOU'D LIKE TO SHARE WITH READERS OF ACE R/C DATA? IT MIGHT BE WORTH A CERTIFICATE ENTITLING YOU TO MERCHANDISE THAT WILL HELP YOUR HOBBY. WE PAY $5.00 PER PUBLISHED ARTICLE UPON PUBLICATION. FANCY ART WORK IS NOT REQUIRED--IT'S THE IDEA THAT COUNTS! SEND US YOURS TODAY AND HELP SHARE THAT TIP THAT YOU'VE DEVELOPED.

The VOM can be considered a very valuable ally, and it can serve your needs for most of your R/C needs. However, we do want to touch on a couple of other items that will prove handy the longer you stay in the game.

Some transmitters are equipped with built in meters. As a rule these meters do two things--measure the battery voltage under one condition, and then measure the RF getting TO THE ANTENNA INSIDE the case. When touching up and fine tuning, you need the milliameter portion of your VOM to get that extra pizzaz.

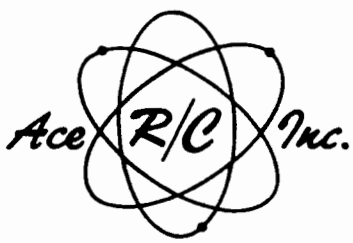
Many R/Cers prefer to use a Field Strength Meter for transmitter checking and measurements. The FSM (Field Strength Meter) is an indicator which is used a few feet away from the transmitter and indicates how much Radio Frequency (RF) is being put out by the transmitter from its antenna OUTSIDE the case. The meter inside indicates only how much is getting to the antenna INSIDE and does not necessarily give an indication of how much RF is being put out.

The Field Strength Meter may be a tuned or untuned RF circuit which is detected by a simple diode detector and fed into a low-range milliameter. Circuitry for such a unit is very simple and may be housed in a small box and plugged into a VOM when used. Other Field Strength Meters use a small case with a built in meter generally in the 0-1 milliampere range. With these a simple diode detector followed by a stage of transistor amplification will give good sensitivity and adequate range.

In practice the FSM is always placed in the same spot relative to the transmitter, and then the final stage of the transmitter, including antenna loading, is peaked for the greatest swing on the meter needle. NOTE--Any portion of the transmitter which is related to the crystal oscillator may be tuned only by some one holding a commercial FCC license of the First or Second Class. The Power Amplifier portion as well as the antenna tuning circuit may be tuned by anyone.

For further checking, some of the FSM units also may be switched to a small speaker or headset and the tone put out by the transmitter may be listened to. Range of units of this type, with diode detection, is very limited. Some builders make monitors of old receivers, although commercial Monitors are also available at reasonable prices. These are much more selective and have greater range. They can be used not only on the bench but on the field to detect the presence of interfering signal from other R/C transmitters or other CB two way voice interference.

Test instruments go far beyond the ones mentioned in this short discourse, but it won't be our purpose to go into them here. Our whole purpose in this article was to give you an insight into SIMPLE R/C testing.



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