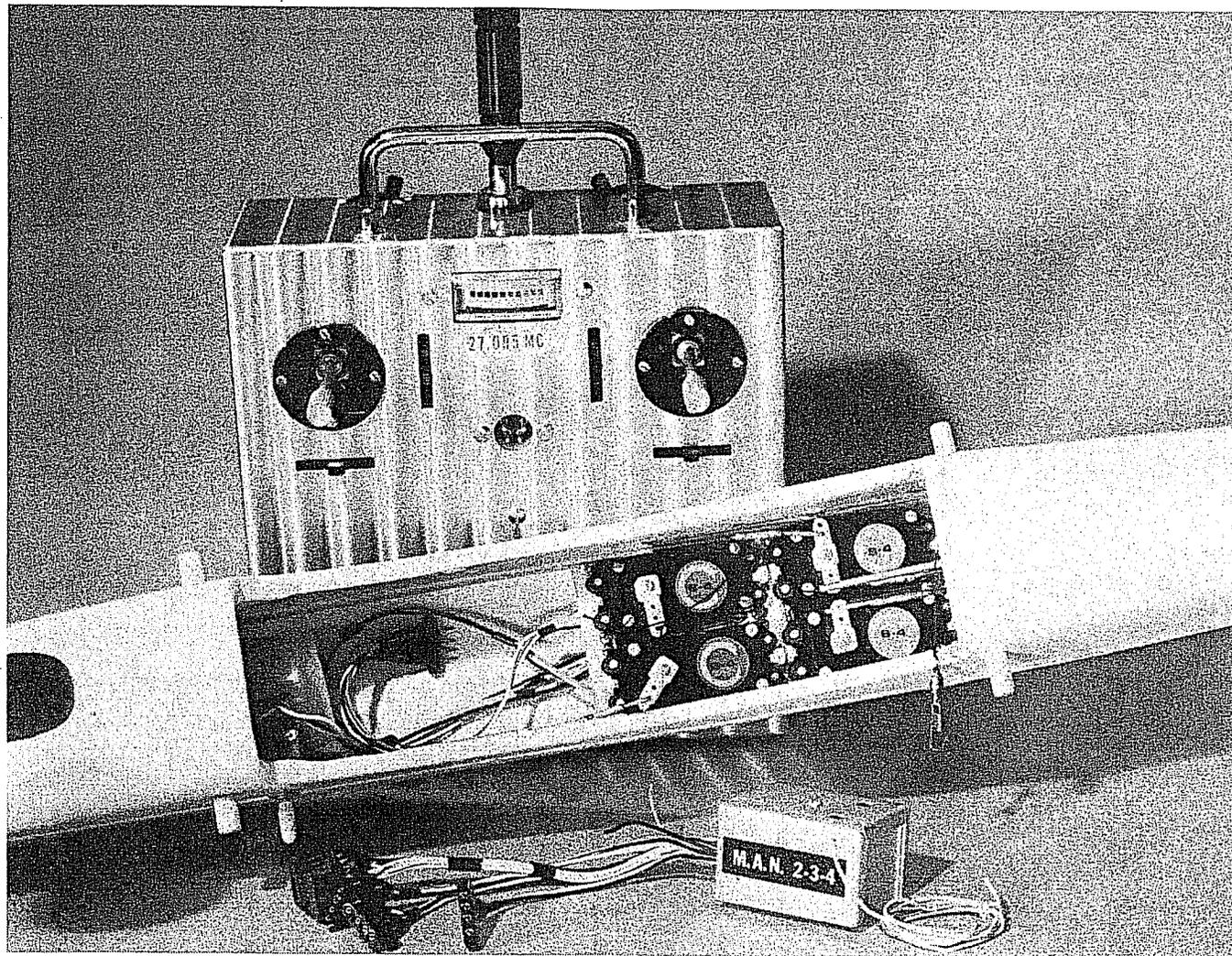


M.A.N. 2-3-4 DIGITAL SYSTEM

Operational Notes and Summary

By DON BAISDEN



Here we have the completed and finalized system at its finest hour, a good installation in a good flying machine and isn't that what we have

striven for over the past five months. Small S-4 servos with the tiny receiver makes a neat, compact and very accessible equipment installation.

System operational notes and miscellaneous tips, hints, troubleshoots, additions, subtractions and cop-outs! Actually this the last installment for the system summarizes project to date.

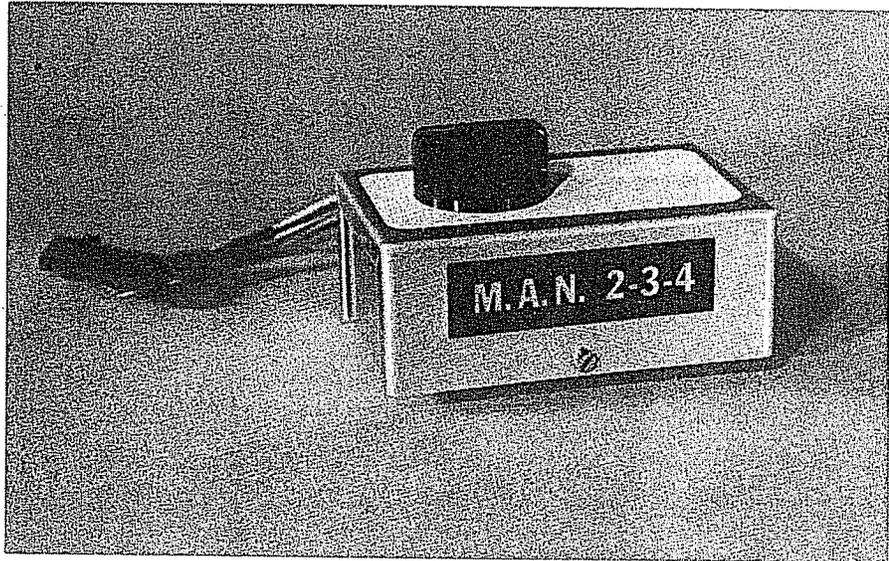
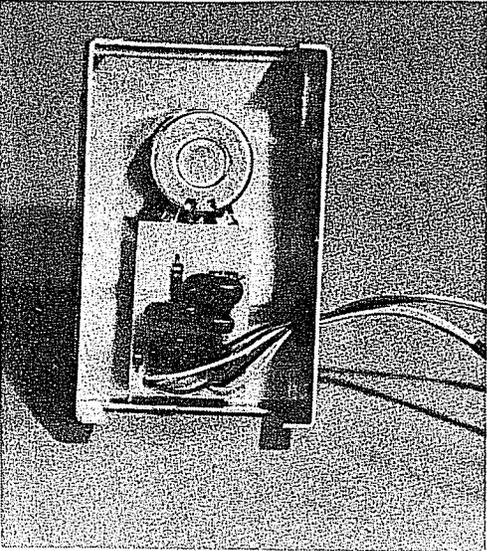
► Perhaps by this time many of you have completed construction of your units and have been gaining flight time. I have made an attempt in this series to try to convey all the information necessary for you to duplicate a successful production system. I feel that the word "production" is important to you, the builder, since what works one time electronically may not work on a repeatable basis. Due to the fact that the system has been on production for almost a year insures that it was not one of those deals where the designer says, "Go ahead, build the transmitter," while he says to himself, "Gee, I sure hope I come up with a decoder that works be-

fore that article is due."

I have heard it said that, in the beginning, all manufacturers made bad digital equipment; that is to say, there were an undue amount of failures in all brands. The pioneers really took a beating, while the late-comers were able to capitalize on the early mistakes of others. We have just gone through the second generation of digital and I really feel that all the major manufacturers make "good" equipment at this time. Popularity of the various brands is pretty much dependent on location and, in general, it revolves around one or several flyers who are consistently successful, know how to fix it and keep

it going, get a good price on the equipment or some combination of these.

I can think of no brand of equipment which does not have occasional problems on an individual set basis. These problems usually can be traced to three causes: pilot error (sometimes called interference or malfunction), interference (sometimes called malfunction) and malfunction (which nobody wants to admit). If we just skip over the first two as inevitable happenings and look at malfunctions, the only one of the three that we can take any precautions against, I think that you would find that in all cases the reason was something pretty simple—a wire



Above and to the right we see the insides and outsides of the M.A.N. 2-3-4 Servo Tester which will be featured in a future issue. Tester permits tinkerers to fix servos without use of transmitter or receiver. Also in the future, not too distant, is a 6 channel transmitter and decoder.

broken or shorted, a transistor or capacitor gave up the ghost, a cell went bad in the battery pack or, for some reason, an apparently perfect servo gear shed its teeth.

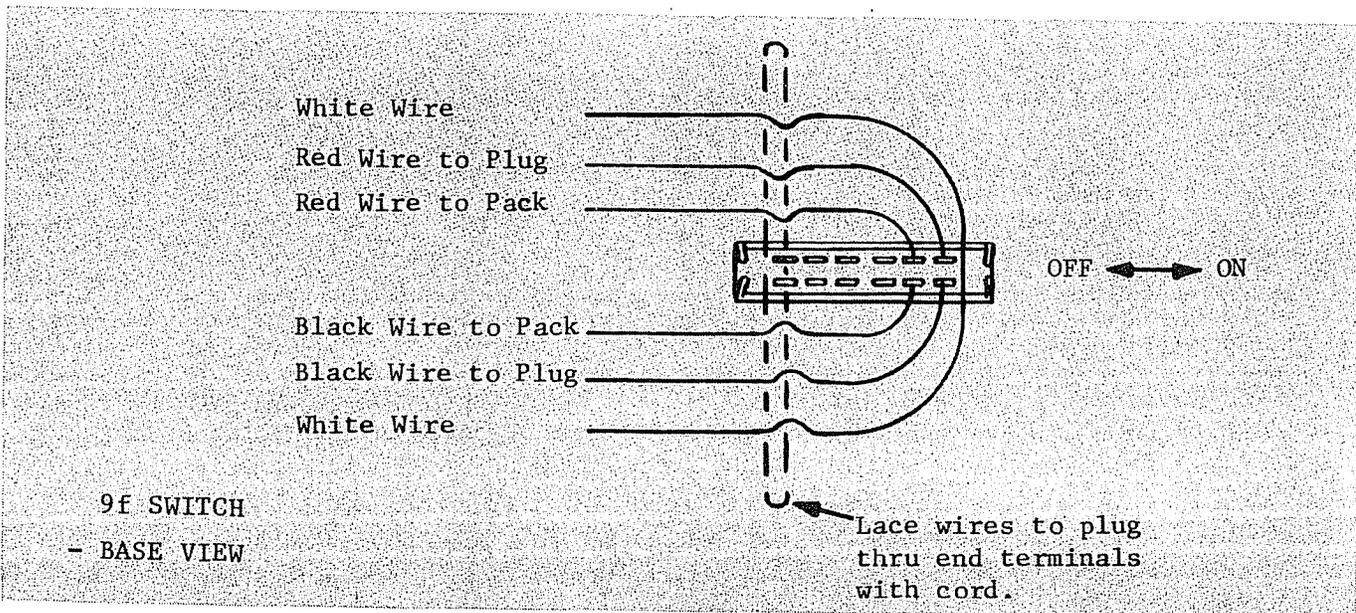
The point that I am really leading up to is that you, the builder, are really the most important ingredient in the success of any system and it does not stop with just the triumphant completion of a kit. The maintenance of any digital system is just as important as the design. The person who flies any system consistently for two seasons "without touching a thing" either does not fly much, made a very good equipment installation, or was lucky. I have seen reed rigs that flew hundreds of flights give the next owner fits. The maintenance problems finally caught up with someone. Electronic component reliability is pretty good and the cause of malfunction is usually something else,

either in construction or maintenance.

At this point I would like to reminisce a bit and tell you about a guy I was fortunate enough to be around as I was growing up in R/C. His name is Al Pinson and many of you, particularly in the South, know the name well, though other responsibilities keep Al from active modeling at the present. Al was the regional representative of "Bramco", one of the most reliable brands of radio in its day. Bramco only made transmitters and receivers and, if you had problems, it usually was not with either of these. Al was the guy to beat at all the contests in the East. He usually built only one plane a year, a magnificently finished model of contemporary design to join his stable of flying machines from last year and the year before, etc. Al is also the guy who has his original multi plane, a "Live Wire Senior" (ever hear of it?) with over a thousand

flights on it, hanging up in his shop. On several occasions, when on trips to that mystic modeler's paradise, Al's basement, I caught Al going over an installation or a stickbox with his jeweler's eyeglass inspecting and testing each solder joint. Al tore his servos down every fifty flights and cleaned the wipers and checked the wires and plugs. To some of the other modelers he might have been referred to as an "Old Lady" (with a bit of envy) on this point. Let me tell you that being an "Old Lady" really pays off. He is the guy that is watching the ball game or sleeping while the "hotshots" are rebuilding an airplane.

You are in an excellent position to maintain your equipment since it was you who made each assembly and connection. Aside from the fact that you should have no hesitancy about getting back into the (Continued on page 78)



M.A.N. Digital System

(Continued from page 47)

system for preventive maintenance or troubleshooting.

Troubleshooting is really a very simple process of analyzing the symptoms, making a few checks and in some cases, a trial solution or two. Preventive maintenance is an inspection process to spot possible failure points but, perhaps mainly it is a matter of taking the time to look for and correct questionable situations. As you built up your system you probably noted in the back of your mind various points that might be possible sources of trouble. In addition, I will try to enumerate the things in each element which, from our experience have proven to be "watch points."

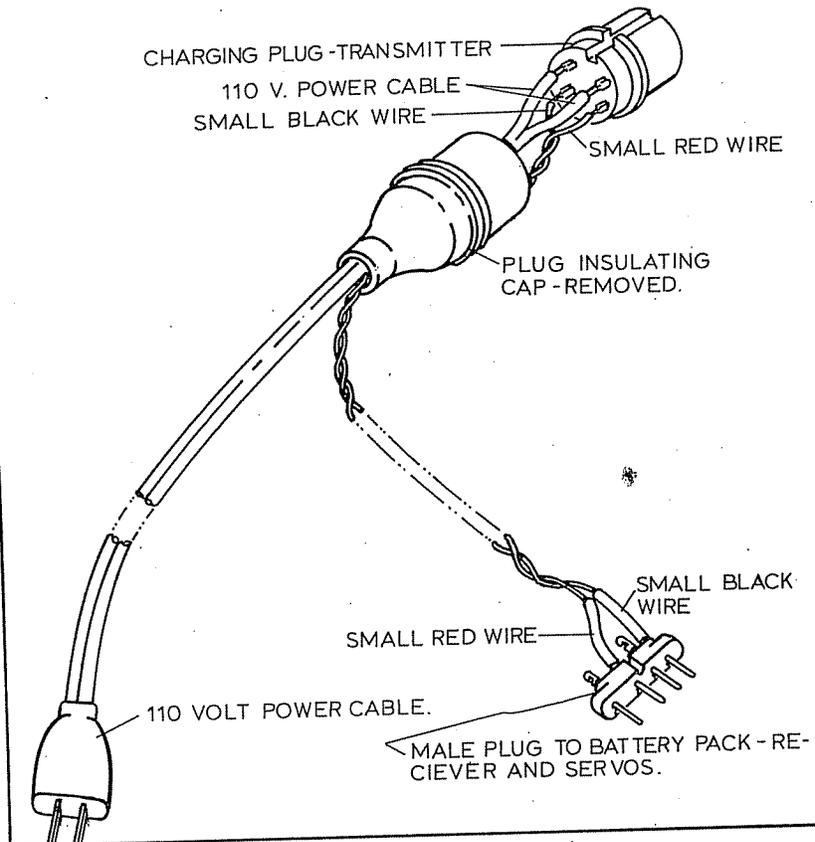
TRANSMITTER

Here we are dealing with wide spacing between lands and very simple circuitry and there is usually little chance of mis-operation. The things to watch for here, initially, are that you (1) get a good ground connection between the brass stand-off, the circuit board and the case; (2) be sure not to trap a wire between the switch and the case, and (3) make sure that you get the control pot wires attached to the correct lugs. Since there are very few movable wires in the transmitter, once it is put into operation there is very little other than general good housekeeping. By "good housekeeping" I mean giving it a wipe every now and then with a cloth before you put it away and, in particular, paying some attention to the antenna. The antenna has small brass contacts in each section which engage in the preceding or larger section. If you allow an accumulation of dirt and grime to build up on your antenna, you have an abrasive element there to work on these brass contacts. The first sign of this is when your antenna becomes sticky when you try to extend or retract it. As time goes on, then it becomes loose to the point where it is making intermittent or very poor contact, all of which tend to cut down your radiated signal or make your signal intermittent. As mentioned previously in the transmitter article, the section directly above the center load is of particular importance. The section containing the center load was cut in the construction of the antenna and the center load electrically rejoins the two portions. When you extend your antenna, always make sure that you feel the upper section firmly engage the second portion of the center load which means that it is making contact and not making contact with the lower portion and thereby shorting out the center load. With the center load.

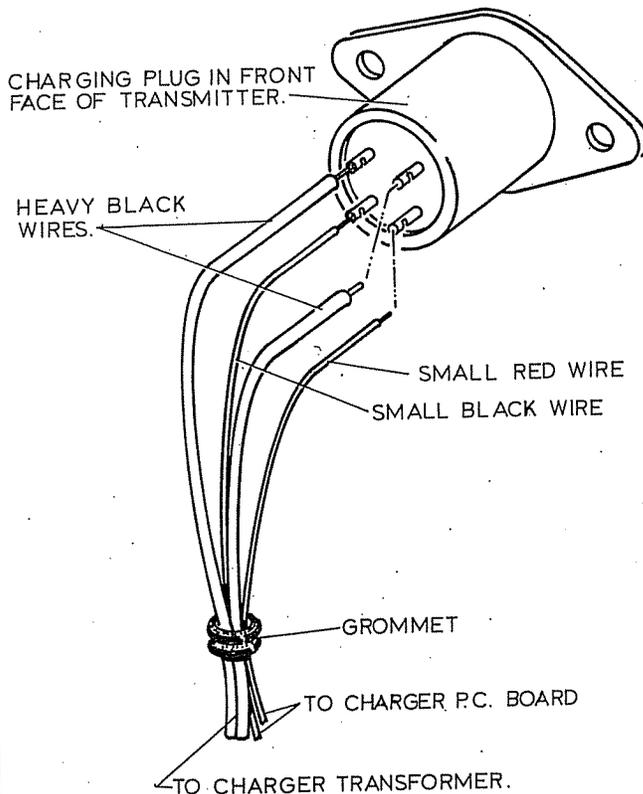
With the center load shorted out, you have effectively about 3' straight antenna with no loading provisions for this condition. the result being that only about 10% of

(Continued on page 82)

CHARGING HARNESS DETAIL



WIRING DETAIL-CHARGING PLUG



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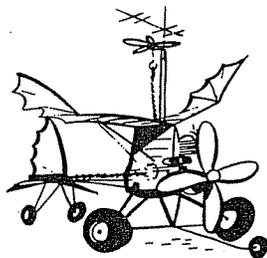
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m.a.n. at Work

by Walt Schroder



► Never have we had a conviction confirmed so completely when our cover man, Tony Bonetti, told of his Route 80 episode. I'm getting a bit ahead so will back up slightly to Maynard Hill's "Shuffle Off to Buffalo" article on page 30, this issue. After reading Maynard's opus which was one of the most exciting pieces that has crossed our desk in a long time, we realized just how much an effort such as this imposes on an individual.

To accomplish this cross-country record dash required a special kind of person who had the imagination to recognize the extremes in human endurance, accept them and then overcome the mechanical as well as natural phenomena that presented themselves all along the 183-mile dash. I enjoyed the article so much that I broke an unwritten rule of editors by writing and telling Maynard how good his article is, even at the pain of spoiling him and placing all sorts of obstacles in my path during future negotiations.

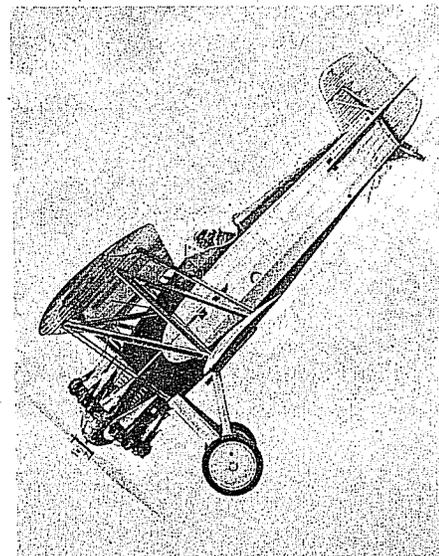
While still feeling the glow from this article, Tony Bonetti arrives for a luncheon appointment and while crossing Fifth Avenue, I just had to tell him of Maynard's supreme effort and he tells me that he knows, he knows and from personal experience as well! Thinking him some sort of a nut, I asked for clarification and am I ever glad I did. Hope the state troopers of New Jersey are not listening!

The many different versions that he has heard regarding the flying speed of the multi birds has always bugged him and he was determined that he would find out if fact or fancy in the only logical way, time it by chasing it in a car,

but how to do it was the problem.

The State of New Jersey came through in fine style by opening a brand new four-lane on each side of a highway in his part of the State and with the assistance of a friend, his Caddy and his trusty P-39, he found out that his bird is capable of 90 mph, straight and level down wind. How it was accomplished though is the story, a full bore hand-launch from the car and then the chase, it only took 12 minutes total and it left him wrung out and shook for days. Measure his twelve minutes against Hill's 3 plus hours and you will appreciate the scope of the cross-country ordeal.

After the launch Tony settled back for a fun deal, (Continued on page 68)



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ON THE COVER

Our cover of Tony Bonetti and his P-39 pages 26, 27 & 28, is by Ron Scalera. One of the freshest new talents to enter our field in many years. His scale picture story on page 17 represents some of the finest model photography to be presented in these pages. A professional photographer and quite young, we can see a good future in model aviation for MAN's latest addition to its staff.